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18 June 1984

# USSR Report

ENERGY



FOREIGN BROADCAST INFORMATION SERVICE

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ENERGY

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COAL

#### IMPROVING COAL MINE MANAGEMENT IN UKRAINE

Kiev PRAVDA UKRAINY in Russian 24 Dec 83 p 2

[Article by B.V. Kachura, member of the Politburo, secretary of the Ukrainian Communist Party Central Committee: "Improving Party Leadership of Coal Mine Operation"]

[Text] Completion of the third year of the 11th Five-Year Plan is approaching. In the work tension of competing for successful fulfillment of the resolutions of the 26th Party Congress, the November (1982) and July (1983) CPSU Central Committee plenums, the instructions of Comrade Yu.V. Andropov clearly expressed the striving of the Soviet people to achieve new heights in their economic, socio-political and spiritual development and in further strengthening the defence potential of our great motherland. This year was marked by further improvement in the work of the Party, Soviet and economic organs, by the growth of responsibility of personnel and by a rise in the level of organization and planning and labor discipline.

As a result, as compared with the average yearly indicators for the first two years of the five-year plan, the rates of economic development in the republic accelerated substantially and the goal established by the party for a basic increase in labor productivity is being successfully fulfilled. By virtue of this factor, the entire growth in the republic's national income is ensured. In 11 months of this year, industrial output worth 1 billion, 874 million rubles above the plan was realized. The state of affairs in capital construction and in railroad transport was improved, and the base sectors of heavy industry moved forward.

The party organizations, the Communists and all the workers of the Ukrainian SSR are augmenting what has been achieved, are actively seeking new forms and methods of organizing matters, are reinforcing order and discipline at the production facilities, are exploring ways to more efficient utilization of the production and scientific-technical potential and are unremittingly improving the economic mechanism.

Operating in unified rhythm with the republic's workers are the majority of the miners' collectives. The republic's miners are solving great and complex problems of providing the national economy with fuel, and the metallurgists--with coke.



The purposeful work to fulfill the resolutions of the 26th Party Congress, the decrees of the CPSU Central Committee and the USSR Council of Ministers on developing the coal industry and the directives of the November (1982) and July (1983) CPSU Central Committee plenums made it possible to a certain extent to stabilize the situation in a number of the republic's coal associations. Due to putting into operation new and reconstructing existing mines, the coal-extraction capacities noticeably rose, and 141 beds were introduced, with the plan calling for 135 beds. Through introducing new drifting equipment, improving labor organization and disseminating the experience of the best drifting brigades, over 8300 kilometers of preliminary workings were covered, which is more than planned. Some 3200 break stopes were put into operation (in place of those taken out), which also exceeds the plan. Therefore, a stable and high-quality break face has been established at most of the mines.

The Donetskugol', Krasnoarmeyskugol', Sverdlovantratsit and Shakhterskantratsit associations are working stably for coal extraction. The collectives of 57 mines in the republic have already reported ahead-of-schedule completion of the plans for the third year of the five-year plan. Mines in the cities of Khartsyzsk, Rovenki and Dobropolye have improved their work.

Yet, however, this year the miners of the republic have fulfilled the coal-extraction plan for 11 months by only 99.7 percent. The Selidovugol', Pervomayskugol', Dzerzhinskugol', Voroshilovgradugol', Stakhanovugol' and Ukrzapadugol' associations have found themselves in a complex situation.

There are several objective causes affecting the work of the coal industry. The main one, however, lies in the fact that the directors of the associations and mines that are lagging behind work in the old way, and do not have the ability to counter on time the increasingly complicated mining-geological conditions with a higher level of engineering provision for production, and to organize the miners' collectives to surmount the difficulties, and are also not actively enough concerned with problems of developing mining work.

Ensuring fulfillment of the plans and socialistic commitments for coal extraction in December 1983 and preparing for stable work in the early days of the new year are imperative tasks for the republic's miners. The party committees and party organizations of the mines and sections should determine the main directions for improving work in each collective and introduce the proper order in production.

The number-one concern has been and remains ensuring an adequate and high-quality front of the working face and skilful use of extraction, drifting and transport equipment. A great deal has been done since the beginning of the 11th Five-Year Plan in this direction. Even today, however, every third enterprise is still not coping with the plans for drifting mine workings, and in a number of cases, does not prepare the workings that were outlined by the program, but those that are easier to drift, even though they will be needed only considerably later.

The party organizations and operations directors of the mines are paying a great deal of attention to further mechanization and automation of production. Today, completely mechanized stopes yield over 60 percent of the extraction, over one-fourth of the preliminary workings are carried out by drifters and cutting combines and up to 55 percent of the load along the sloping workings and up to 22 percent along the horizontal is delivered by conveyor.

There is, as they say, progress. All the work, however, must be brought to a logical conclusion, i.e., a real yield must be obtained in the form of an increase in extraction and growth of labor productivity. In October of this year, a conference of obkom secretaries, a number of party gorkoms and general directors of associations was held at the Central Committee of the Ukrainian Communist Party, and there was a discussion of the basic directions and specific measures for improving coal extraction.

The state of affairs in the sector requires general concentration of attention on unsolved problems, eliminating shortcomings and intensifying party leadership of coal mining work, which means, above all, increasing the attention of party committees and primary party organizations to ensuring the well defined, well coordinated work of all the production units and the need to change drastically, psychologically, the deeply-rooted opinion held here and there by operations directors and even some party workers, that non-fulfillment of the extraction plans is a permissible occurrence. A most decisive battle must be waged with this.

In the sector there are still several mines and sections which for years have not been fulfilling the planning assignments for coal extraction and rise in labor productivity, and allow considerable overexpenditure of resources. Radical measures are needed to lead these collectives away from this break. There is experience of their acceptance. It can be shown by using the example of the Donets Zapereval'naya Mine, which for a number of years found itself among those lagging behind. Here they changed directors and drew up hundreds of measures to give assistance, but the situation did not change for the better until a neighboring, stable working collective of the Mine imeni Gazeta Sotsialisticheskii Donbass took over sponsorship of the lagging enterprise.

The collectives were combined. The basic mine temporarily took on three plans for extraction, and drifting brigades, machine operators, and a medium-sized supervisory staff made up of a number of experienced specialists from the Mine imeni Gazeta Sotsialisticheskii Donbass were sent to the Zapereval'naya. After six months the Zapereval'naya Mine had doubled the extraction volume, and the collective confidently entered the ranks of the leaders.

There are many such examples in the sector. They attest to the fact that if sponsoring work is carried out, not formally, but in consideration of the special aspects of the work collectives, there will be good results. The obkoms, party gorkoms and operations directors of the associations and mines should make active use of this practice of leading out of the break the collectives that are lagging behind and doing everything possible to sharply reduce in the sector the number of enterprises that are not ensuring the planned goals.

A subject of daily concern to the Party, trade union and economic organs should be the implementation of practical measures to ensure breakdown-free work of the mining equipment, particularly now, when the saturation of coal mines with powerful and complex equipment has risen immeasurably. At the leading mines in the central region the attention of the operations directors and Party organizations is fixed above all on the work of mechanized power services. This is justified.

The extracting brigade of Hero of Socialist Labor A.D. Polishchuk of the Donets Trudovskaya Mine won out, and its coal-extracting complex serves without failure for two, or even three normative periods. Due to the efficient use of the equipment, the brigade of USSR State Prize Laureate V.I. Ignat'yev from the Krasnolimanskaya Mine of the Krasnoarmeyskugol' Association, completed fulfillment of the year's plan for coal extraction a month ahead of the deadline, and issued to the surface, since the beginning of the year, from one longwall, a million tons of fuel. The failure-free work of the drifting combine made it possible for the brigade of Honored Miner of the UkSSR from the Dnepropetrovsk Pavlogradskaya Mine, V.M. Vernigora, to bring the average monthly drifting rates to 417 meters, and ahead of schedule, on 23 June of this year, to complete the plan for three years and cover 13.8 kilometers of workings, almost 4 kilometers of them in this year.

The main thing to which attention is directed in these collectives is ensuring the preservation and long life of the mining equipment. Strictest adherence to the repair and preventive maintenance regime has become the rule here. Moreover, each worker is assigned to a specific machine and mechanism and personal responsibility is put into practice for the technical condition of the equipment, not only for the repair, but also for the extracting and drifting shifts. Everyone here knows what material and moral incentives have been established to reduce the overhaul periods and [increase] the failure-free work of the equipment.

Recently, however, many workers in the technical and power machine administrations and sections of the ministry, associations and mines have begun to regard the work organization of machine operators, their training and dissemination of experience as a secondary, commonplace matter. This immediately had an adverse effect on the coal extraction.

The obkoms, Party gorkoms, primary Party organizations, trade union committees and economic organs must draw the corresponding conclusions from this, and take under their control the work of constantly functioning schools of innovators, holding days for machine operators and rallies, wide-scale development of the young miners' movement "From the Tekhminimum--To the Tekhmaksimum" [From the Technical Minimum--To the Technical Maximum], and concluding of joint agreements between the miners and machine builders on ensuring reliable work of the equipment. Concern should also be shown for highly productive operation of the machines and organizing their work with maximum loads for the corresponding conditions.



Work must be activated on generalizing and widely disseminating advanced experience. It should be regarded as a direct and therefore extremely important duty of each director, engineering and technical worker and all communists. In this connection, wide-scale use of the comprehensive system of regulating the incorporation of advanced experience, developed in Donetsk Oblast can yield an essential positive effect.

At the past Party meetings held in the sector to hear reports and elect new officials, the communists, while wholly approving the party measures adopted for further strengthening of the country's economic system, in a businesslike manner, self-critically revealed the shortcomings impeding work. Particular attention, and this is quite correct, was directed toward the resources and potentials which exist at each work place, wider use of brigade forms of organizing and stimulating work, activating socialist competition, and, in particular, development of its directions such as communist mutual assistance, and toward accelerated development and full utilization of production capacities, saving materials and electric power and fuel. Work must be done in this way, stressed many of those speaking at the meetings of the Kochegarka, Komsomolets Donbassa, Molodogvardeyskaya and Samarskaya mines, so that there not be any lagging behind side by side, so that each worker cope with the norm, and the brigade--with the assignment and the enterprise--with the plan. Severely analyzing the state of affairs, the communists noted that in some party organizations, a state of a high degree of principle and mutual exactingness had not yet been formed. Sometimes they are reconciled to the fact that the party members do not fulfill the output norms, and the production subdivisions, headed by communists, lag behind, labor productivity increases more slowly than the wages. At times in the party organizations the proper evaluation of acts of non-discipline, mismanagement and wastefulness is not obtained. In speaking of shortcomings, the communists introduced suggestions on how to eliminate them, outlined measures to augment the role of the primary party organizations in the life of the work collectives and responsibility of the directors and all the workers to ensure production plans.

In cementing and uniting, the miners collectives and small groups have undertaken something most difficult, by word and personal example to attract others to themselves. It is gladdening that the party ranks of miners are growing steadily. In the coal industry now there are almost 129,000 members and candidate-members of the party--5000 more than before the 26th CPSU Congress. While as a whole for the Communist Party of the Ukraine, the number of communists during the two years since the congress increased by 3.6 percent, in the coal industry--by 3.9 percent, and moreover among the underground workers--by 5.2 percent.

The CPSU Central Committee has placed among the most important tasks the utmost strengthening of discipline, organization and order. Disciplinary strengthening is not reduced only to punctual appearance at work, but is also linked with the way in which the work time is utilized, and what the result of the work is.

The level of discipline in the coal industry is consistently rising. This is particularly noticeable since the November (1982) CPSU Central Committee

Plenum. More and more worker collectives in the sector are working without disruption, in a coordinated and organized manner, and this helps them to overcome successfully temporary difficulties and to find creative solutions to the problems posed. For example, in the brigade of miners at the breakage stope of the Mine imeni Frunze of the Roven'kiantratsit Association, headed by bearer of the Order of the Red Banner of Labor, Communist A.N. Tkhor, the accuracy and coordination in work and the high level of collective responsibility and personal discipline form the basis of the daily work of all 89 members of the brigade.

This helps the collective find the correct way out of the most complex situations. For example, once at the mine the drifting work was lagging behind and great difficulties arose with the preparation of the breakage face. Then the communists of the brigade and the section management decided to prepare the breakage stope through their own efforts. For this, all the brigade members mastered the work of drifting and now work at drifting by turns. Indeed, they have organized things so that they monthly drift 75 meters each of workings with average monthly rates of 60 meters at the mine. Moreover, not only are they not reducing, but even increasing the coal extraction volume. With the aid of the mechanized Donbass complex, the brigade, in this five-year plan, has extracted 1,047,000 tons of anthracite, including 140,000 tons above plan. The average daily extraction was 1050 tons, with a goal of 984 tons. Ahead of schedule, on 10 November this year, the year's plan was fulfilled, and the collective is working on the quota for 1984.

This experience, however, is still being disseminated slowly. The technical services of the associations and ministry do little to have it become the property of all the collectives, where serious difficulties have arisen with respect to on-time preparation of a high-quality breakage face.

Distinguished by a high degree of discipline and standards in work and an engineering, creative approach to organizing affairs are the brigades of breakage stope miners headed by N.Ya. Reshetnikov from the Mine imeni A.G. Stakhanov of the Krasnoarmeyskugol', M.V. Protasov from the Mine imeni 26th Congress of the Pavlogradugol' Association, V.I. Rybinskiy from Mine No 3, Belikomostovskaya of the Ukrzapadugol' Association and many others. The sector now has 269 brigades which daily extract 500-1000 tons of coal each, and more, and 280 high-speed drifting brigades. Their experience should become the property of each labor collective.

Solving the problems facing the republic's miners in many ways depends on raising the level of selection, placement and training of the personnel. "Working with personnel," said Comrade Yu.V. Andropov, "must be firmly held in party hands." People must be evaluated not by assurances and good intentions, but by specific deeds and by the ability to ensure proper discipline and to form in the collective a healthy moral-psychological climate and to achieve fulfillment of the state plan for coal extraction under any conditions.

This spring the Central Committee Politburo of the Communist Party of the Ukraine examined the way in which the UkSSR Ministry of the Coal Industry

was fulfilling the resolutions of the 26th CPSU Congress on improving the selection, placement and training of directing and engineering-technical personnel and on preparing the workers in mass vocations. The analysis showed that the coal industry has sufficient personnel potential at its disposal to ensure fulfillment of the tasks facing it. The saturation of professionally qualified specialists in the sector has increased. At each mine now, on the average, 105 persons are employed with higher, and 306 persons with secondary specialized education.

In a word, the possibility exists of selecting not only experienced directors, with initiative, for the associations and mines, but also intelligent, highly qualified supervisors of the middle unit--chiefs and mechanics for the sections, their deputies and mining foreman. Many mines are now headed by young, energetic, quite experienced specialists, and there are more engineers among the chiefs of the sections, directors of the services and head specialists.

Yet, the work with the personnel does not yet meet today's requirements. The board of the ministry, association directors and party committees do not always display the proper adherence to principles and strict exactingness when selecting the supervisory workers and do not come to know them well in practical matters. From this comes an unjustifiably high amount of replacement of personnel. Since the beginning of the five-year plan, at every second mine the directors and chief engineers were replaced. At the same time, almost half of them were discharged from their duties as not having ensured the work of the section entrusted to them. Of course, with such a degree of personnel replacement, it is not just ensuring the necessary development of the mining operations, but even introducing elementary order at the mine is quite complicated.

Problems of the social development of the miner collectives and a further improvement in the work and everyday living conditions of the miners should hold a very important place in the work of the party committees and primary party organizations. The state grudges no resources for these aims. The problem lies in utilizing them to the full extent, in the established periods. There should be more active use of the experience of the mines imeni Zasyad'ko in Donetsk, imeni Gayevyy in Gorlovka, Voroshilovgrad No 1 in Voroshilograd, Velikomostovskaya No 3 in Chervonograd, where this matter is well organized and the prestige of the miners' occupations is raised in every possible way.

Before the end of the current five-year plan, the republic's miners are faced with fulfilling a large amount of work to develop mining operations, to bring the relative proportion of advanced systems of working the coal beds to 70 percent, of comprehensive mechanization of breaking work--to 65 percent, and of working mines with combines--to 32 percent; to complete in practice automation of stationary mine units; to have at work 150 brigades of mineworkers for the breakage stope, extracting 1000 and more tons of coal each per day, and 230 brigades extracting 500 and more tons each at shallow beds; to do everything to secure the positive tendencies in work at the mines and achieve unconditional fulfillment of the planned assignments for coal extraction.

Socialist competition, which is acquiring increasing importance in the solution to key social and economic problems, should be governed by this. Now being widely developed in the republic is the movement of work collectives to accelerate scientific-technical progress, raise the qualitative indicators of work, and above all, fulfill the planned goals for the growth of labor productivity, economical and efficient use of material and energy resources. In the vanguard of those competing go the collectives of the Progress and Kommunist-Novaya mines of Donetsk, the mines imeni 60-Letiya of the USSR, imeni Kosmonavty of Voroshilovgrad, imeni Leninskiy Komsomol of Dnepropetrovsk and imeni 50-Letiya Velikaya Oktyabr'skaya Sotsialisticheskay Revolyutsiya of Lvov Oblast and others.

The party organizations of the republic's coal industry enterprises can and should apply all their efforts and multi-faceted experience to mobilize the workers for successfully carrying out the resolutions of the 26th Party Congress and the subsequent CPSU Central Committee plenums and for unconditional fulfillment of the programs of the 11th Five-Year Plan.

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## COAL

### INTRODUCING NEW MINE EQUIPMENT EXPEDIENT

Moscow STROITEL'NAYA GAZETA in Russian 25 Jan 84 p 3

[Article by N. Umnov, head of the laboratory at Kuznikshakhtostroy, candidate in technical sciences: "The Path to the Stope is a Long One"]

[Text] The resolutions of the 26th Party Congress set a task of particular state importance for the Kuznetsk coal basin: in a single 10-year period to increase coal extraction by almost one-fourth. The strategy for the increase was also determined--reconstruction of existing enterprises, and constructing large open pits. Consequently, this can in no way be managed without equipping the mine construction workers with the newest means of mechanization. This is well realized by the local inventors and innovators, by showing a high degree of creative activity. They do not, however, obtain the necessary support from the USSR Ministry of the Coal Industry. As a result, valuable developments of the innovators take years to reach a broad circle of production workers, remaining only display exhibits.

At the all-union scientific-technical seminar on the problems of increasing the speed of sinking mine shafts, which was held at the Exhibition of USSR National Economic Achievement, the attention of mine construction workers was attracted by an invention of specialists from our institute--Kuzniishakhtostroy in Kemerovo--the SMBU-3M shaft drilling unit for drilling blast holes. Consisting of a rigid metal column with three drills mounted on it, the unit, in the course of industrial tests in reconstructing mines in the Kuzbass displayed enviable technical-economic qualities: as compared with the manual method, it accelerated work 1.5-fold, and cut by two-thirds the number of drill operators. Due to this, when sinking only four kilometers of new shafts and one kilometer deepening at existing mines, 16 experimental units, manufactured according to our designs by the Novosibirsk Sibgiprogoromasha Pilot Plant of the USSR Ministry of the Coal Industry, made it possible to save over half a million rubles of direct input. And how can one measure the lightening of the mine construction workers' work?



The merit of the SMBU-4M (this is what they have begun to call the new unit since perfecting individual assemblies) lies in the potential for sinking large-diameter shafts. I shall give an example of this. The brigade of Hero of Socialist Labor, delegate to the 26th CPSU Congress, Sergey Nagornov from the Kuzbasssshakhtostroy Combine at the new Kuznetsk Yubileynaya Mine of the Gidrougol' Association, numbering 42 persons, on 1 September 1982 sank 85 meters of prepared cage shaft, 8.5 meters in diameter. The output norm was thus exceeded almost 2.5-fold. In all, the advanced collective in a short time sank this shaft to a depth of over 500 meters, coping with a critical assignment ahead of schedule.

In order to estimate fully the advantages of mechanized drilling of blast holes, one should remember: the number of deepened and newly constructed shafts of varying diameter in the coal industry is continuously increasing. But the sinking must be done in the old way, with manual drills. That is why the appearance of the SMBU-4M was received by production workers as a great event, not only in our country, but also abroad. Judge for yourselves. Numerous orders arrived at Kuzniishakhtostroy from the Donbass and Karaganda. Mine construction workers in Bulgaria and the GDR also expressed a desire to acquire the unit.

Unfortunately, we still cannot give a consoling answer to anyone, for in the eight years since the drilling unit was shown at the Exhibition of USSR National Economic Achievement and was described in detail in the technical press, it has never been cleared for series production. Nor has a batch of 40 pieces, specified by special order of the USSR Ministry of the Coal Industry, been issued. Ugletekhsnab did not allot funds for the items comprising it to the Sibgiprogorrmash Plant, which was commissioned to fulfill the first order. Finally last year the funds appeared, and the Novosibirsk workers made eight units. After all, though, this is a drop in the bucket, since they are needed equally by both the coal workers and miners of the USSR Ministry of Ferrous Metallurgy and the USSR Ministry of Nonferrous Metallurgy. I shall not even mention the foreign orders. So, if one puts together all the demands, they will be measured in hundreds of pieces. This means that it is no longer a departmental, but an intersectorial problem, and it must seriously be solved.

The above can with full basis also be related to mechanization of reinforcing the major horizontal and sloping workings. Used in their construction today, in many cases is a solid concrete support, with a stock form and primarily manual laying of the mixture. Seven ministries and departments are concerned with this labor-intensive matter, while only the USSR Ministry of the Coal Industry yearly braces with concrete about 60 kilometers of various workings. The cost of this method of reinforcement is high: from 35 to 50 percent of the total expenditure for tunnelling. After all, our institute, as early as the 60's developed and proposed for the mine construction builders a convenient mobile form, making it possible to raise labor productivity immediately three- to five-fold. The form was recommended by the acceptance commission for series production. There is also an order by the Ministry of the Coal Industry on series manufacture of mechanisms for adjusting the form at the

Prokop'yevskaya Repair-Rolling Items Base of Kuzbassshakhtostroy. However, the Prokop workers, due to a lack of the necessary machine tool stock and the overload of repairs for mining equipment, could not make the mechanical rearrangements. As a result, a good idea, as they say, was left hanging in the air.

Wide-scale use of another form of advanced support--a smooth-walled piping structure of Kuzniishakhtostroy--is furthered by the TU-2R and TU-3 pipe-stackers, designed by us, and possessing an extending-telescopic boom and semi-automated trailer assembly, reducing the labor-intensiveness and the time for support work. The first models of these highly productive mechanisms, which satisfied acceptance tests as far back as 1975, were manufactured in the workshops of our institute. Later, in accordance with corrected designs, seven pipe-layers were made by the experimental plant of the Karaganda Scientific Research Institute for Coal. At present series output of the pipelayers is being developed at the Shakhtinskiy Machine and Repair Plant of the Rostovshakhtostroy Combine for the needs of Soyuzshakhtostroy organizations.

The first batch of pipe-layers, however, was rejected and altered, and the next ones are far from being made up in full volume. The Shakhtinskiy workers complain about the poor degree of equipment of their enterprise and shortage of metal-cutting equipment and items to complete assemblies.

Thus, three innovations have a similar, equally sad fate. It is caused above all by the underestimation of mechanization for the work of the mine construction workers. With a serious attitude toward the problem, there would surely be found in the system of the USSR Ministry of the Coal Industry sufficiently prepared manufacturing plants and the resources for the equipping items. Organization of series output of the designated mechanisms also merits examination at a higher intersectorial level.

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## COAL

### MINE WORKING CONDITIONS DISCUSSED

Moscow ARGUMENTY I FAKTY in Russian No 46, Nov 83 p 5

[Article by Chairman of the Coal Industry Trade Union Central Committee, Hero of Socialist Labor M.A. Srebnyy: "If You Are a Mine Worker ..."]

[Text] The USSR is the only state in the world which builds its economic system on the basis of its own power resources. In the total volume of extraction of all types of fuel, in our country coal has approximately a 25-percent share. In the very near future, however, according to the predictions of specialists, this mineral can become the basic source of energy.

Today, Chairman of the Coal Industry Trade Union Central Committee, Hero of Socialist Labor M.A. Srebnyy, appears on the pages of our bulletin.

Coal is extracted today in the USSR mainly with the aid of highly productive mining equipment, but the work of the miner still remains one of the most labor-intensive. Therefore, our state is doing everything possible to lighten the work and improve the social-everyday living conditions of mine workers and to show concern for organizing full-value leisure and safeguarding their health.

What then, specifically, has already been done in this direction in the last few years, and is slated to be fulfilled in the future?

Every third ruble allotted today from the state budget for development of the coal industry is spent to lighten the work of the miner, to make it more attractive and, the main thing--safe.

Equipment capable of "suppressing" the dust, good ventilation and--very important--regular medical check-ups for the miners has made it possible to reduce occupational diseases to a minimum. At even the least suspicion of disease, the mine worker is immediately relieved from work and undergoes a preventive treatment program. The results? In the last 10 years instances of occupational disease are two-thirds lower.

A danger, age-old, lying in wait for miners is methane gas. Today absolutely all stopes have been equipped with accurate sensing devices. When the methane content deviates from its normative proportion, all the mining mechanisms automatically stop immediately. In order to eliminate any chance of accident, monitoring of the atmosphere in the mine is backed up by 3-4 systems.

Only in 5-7 percent of the instances is equipment the cause. In the rest of the cases the rules of working underground are violated. A modern, well-equipped mine, apparently creates the illusion of complete safety, which at times is turned into tragedy.

About 100,000 national inspectors are called upon to monitor adherence to the rules of labor safety practices in the nation's mines. In addition, there is also technical inspection work by the Central Committee of the trade union, invested with broad monitoring rights. It numbers 390 technical inspectors. They are assigned to specific enterprises. This gives them the opportunity to be constantly well informed on all the projects. The technical inspectors of the trade union are endowed with great authority. They have the right to give the administration or individual officials instructions, that must be carried out, on eliminating violations of the legislation that have been discovered and to place before the corresponding trade union committees the question of suspending the work of shops and enterprises that do not answer to the rules of labor safety practices and industrial sanitation.

Without permission of the trade union's technical inspectorate, not a single newly constructed object is accepted for operation, and without its decision, new equipment is not launched into series production.

No matter how effective the mechanisms that have come to the stope to take the place of miner's picks and shovels, even today a miner's job remains a heavy one. He is paid in accordance with the expenditures, and therefore miners' wages are considerably higher than those for the representatives of many other work occupations.

The average wage for miners in 1982 was 312 rubles a month, for those engaged directly in extracting coal--345 rubles. In the northern regions it is higher --500-600 rubles. Beginning in January 1982, in accordance with proposals of the trade unions, the rates and salaries for coal industry workers were raised. This measure affected 1.5 million persons, whose wages rose on the average by 27 percent.

Miners have a 30-hour work week. They also have the longest paid leave in the world--36-48 days. Miners obtain pension rights earlier than others--at the age of 50 years, if they have 10 years of underground work service. At their service are sanatoriums, clinics, holiday homes in the best health resorts. Every year about 400,000 members of our trade union relax in them. One-fifth of the travel authorizations are issued free, and the rest--with the miners paying 30 percent of their cost. The supplementary payment is made up by the trade union committees from the state budget for social insurance.

At many enterprises, at the proposal of the trade union committees, part of the resources from the administration fund, destined for social-cultural measures and housing construction, are expended to lower the cost of food at the workers' dining halls, organizing free or preferentially priced dietetic food for those who need it and hot meals for the miners directly underground. Last year alone about 5.5 million rubles were spent for these purposes.

It must be said that one of the critical problems for us remains the housing problem. We are constructing a great deal, but all the same housing is still in short supply, above all in the eastern regions now being opened up. The state, at whose expense the housing is mainly being constructed, in just the last five years allotted us huge sums--over 1 billion rubles. Some 170,000 miners' families obtained new apartments during this time, but still not all those who need this. The money is there, but is still not fully put into use; there is a shortage of construction capacities, particularly in the eastern regions.

In the last few years the construction of individual housing has been developed. If a miner has decided to build this kind of house, he is given assistance and considerable benefits are granted him. He obtains a loan amounting to 80 percent of the estimated cost of the house.

The mine directors are granted the right, upon agreement with the trade union organizations, to reduce the amount of the initial fee to 10 percent for persons discharged from active military service, young married people, young specialists, and also for workers engaged in particularly complicated, difficult work.

The miner's family will pay off the loan over a period of 15 years, beginning with the second year after the construction is completed, and moreover it is obliged to refund only the part of the sum that it received as a debt to the state. The enterprise at which the miner works pays off 40 percent of the loan.

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## COAL

### KUZBASS PROGRESS PROBLEMS DISCUSSED

Moscow SOVETSKAYA ROSSIYA in Russian 21 Jan 84 p 2

[Article by V. Denisov and V. Dolmatov: "How to Get a 'Second Wind'"]

[Text] When one thinks of the Kuzbass, one wants to use superlative epithets. Here are high-quality coal, thick beds and the largest mines and open pits in the country. Every third ton of coke comes from here. Authoritative scientists--academicians A.G. Aganbegyan, M.A. Stvrikovich and others already call the Kuzbass "the all-union stokehole", having in mind not so much its present position, as its future one. According to the calculations of specialists, coal extraction in the basin can reach 550-600 million tons a year. This is--sometime. Today, however.... Well-grounded alarm is arising for the reduction in the yield level of the sector's coal industry, which is operating unstably and has not coped with the assignments of the three years of the five-year plan.

Remember, six years ago in all the coal cities of Kemerovo Oblast, transparent banners appeared for the first time, calling for the extraction of 150 million tons of fuel a year. Even last year, however, this milestone remained unattainable. More than that, the extraction level fell. The impression is that Kuzbass, like a powerful train tried with a running start to surmount a steep rise, could not--and backed up. How to gain speed again? Both theoreticians and practical workers know the answer--build up all the technological directions existing in the basin. But there is no resulting steady movement. The main reason for the losses is a delay in modernizing the mines.

On a February morning last year,, V.M. Yerpylev, director of the Nagornaya Mine, immediately congratulated brigade leader A.F. Nikitin on two events: his 50th birthday and a record daily extraction--5100 tons of coal from a single longwall. The record was established at the new Kusheyakovsk section--and this was the special meaning of the director's congratulations. Long ago the coal resources at the existing horizon were approaching the end--even a work cutback, and then after modernization--a new take-off.

The special feature of mining enterprises is the fact that the coal resources prepared for extraction become exhausted, and in order for the mine not to stop, new stopes must be added to replace those being worked, deepening the shaft or opening up other territories. For the Kuzbass coal miners, rebuilding, according to calculations, should be carried out every 8-10 years, and continue not over 4-5 years. At the Nagornaya, transition to a new sector took 4 1/2 years. Alas, this by no means happens everywhere. In the Kuzbass there are 67 mines of the USSR Ministry of the Coal Industry in operation,

or more precisely, of its All-Union Kuzbassugol' Industrial Association. That's nice! there are 29 mines undergoing rebuilding at the same time. Does this mean that the mines will soon get their "second wind"? Hardly. We had a characteristic conversation with V.A. Dolgushin, general director of the Prokop'yevskugol' Production Association.

"The situation has turned out to be very difficult," Vladimir Afanas'yevich was frank. "Of the ten mines of the association there are seven under reconstruction. But what is the use, if the work will be carried out for 16-17 years on the average? A pathetic record has been entered in our region: the Krasnyy Uglekop Mine has been under renovation since 1959."

While striving somehow to maintain the extraction, the miners have been forced to disrupt the normal industrial cycles. The miners by their own efforts open up the lower horizons, destined for reconstruction, and do the finishing off through sloping fields. A.I. Petrov, chief of the Kuzbassugol' VPO, cited these data: already at more than half of the mines the extraction is done at sloping fields from temporary schemes. As we can see, the "round-about" low-productivity technology is wide-spread.

The basic contracting organization at the production projects in the basin is the Kuzbasssshakhtostroy Combine, consisting of a few specialized trusts. The sphere of applying their efforts--the establishing of new, independent coal extracting enterprises and the thorough reconstruction of the mines. Even though in the Kuzbass not a single new mine has been cut in 20 years, the contractors for reconstruction are not distinguishing themselves either. Not once since the beginning of the Ninth Five-Year Plan has the combine fulfilled the year's plan.

So, at Nagornaya they took it upon themselves to build a new section, which would more rightfully be called a mine. If, however, provision for the new construction project proceeds according to the planned procedure, the "self-constructors" will have had to "break loose" and "deliver" almost everything by fair means or foul. Now, following the example of Nagornaya, sections of Yubileynaya and Tsentral'naya are building themselves. Not relying on the general plan for contracting, the miners have been forced to count only on their own efforts. Beginning with the end of the 70's, internal trusts have been newly revived in production associations for coal extraction. In order not to be confused with the contracting ones, they are called coal-construction. They are increasing at the mines their sections of capital mining work.

We met I.S. Lutkov, manager of the Yuzhkuzbassuglestroy Trust. Formed five years ago out of incomplete mining brigades and groups, the trust is already fulfilling work through its own efforts worth almost 9 million rubles. One curious detail: "buildings and structures" constitute almost 40 percent, that is the very surface projects that the Kuzbasssshakhtostroy Combine is collapsing so successfully. Here it is precisely: saving the drowning is the work of the hands of those themselves drowning. One-fourth of all the construction installation work is now being carried out with the aid of the operational method at Kuzbassugol'.

Of course, it is not a good thing that Kuzbasssshakhtostroy is conceding its field of activity to independent construction workers. In a specialized organization the technical equipment is better, the supply is more reliable and labor productivity is higher. The trouble is, however, that the resources of the mine construction workers do not correspond to the needs of the miners. For many years the yearly plans of the combine cannot be considered practicable. For example, in 1980 it fulfilled by its own efforts construction-installation work worth 114.1 million rubles, and the following year an "addition" of 23 million was planned for it. In 1983 an actual indicator of 118.7 million rubles was achieved, and in 1984, proposed for Kuzbasssshakhtostroy is neither more nor less than--154.9 million.

From where can the increase come? We chatted with Yu.S. Okhotnikov, chief of the combine, and other specialists. It becomes clear that Kuzbasssshakhtostroy is constantly short of 1500-2000 workers and that the production base, even by stretching a point, cannot be called modern. The combine's plants are poorly equipped, the technology is outdated and they are capable of satisfying the demands of the mine construction workers for precast reinforced concrete by only 75 percent and for carpentry items--barely more than half, and for building metal structures--by 8.7 percent! So the directors of Kuzbassugol' have to develop a method of operations using its own resources for construction. Initiative and enterprise are a good thing. But is the amount of independent action in this case not too great?

How did it happen that the mines and construction organizations providing for them, in one of the largest basins in the country, found themselves in such a difficult situation? It seems that the point is that at the USSR Ministry of the Coal Industry they have still not realized the long-range significance of the Kuzbass, and as before they direct the lion's share of the resources to basins that are dying down. The Kuznetsk mine construction workers, for example, have a machine-equipment ratio lower than average for the sector; they are short of excavators, tower and truck-mounted cranes and other equipment. As a result, labor productivity increases extremely slowly at Kuzbasssshakhtostroy. Last year the output per worker proved to be slightly over 7000 rubles, while the rise to the average level achieved as far back as the Ninth Five-Year Plan, was not even 15 percent. By today's standards, 7000 rubles a year for a construction worker is an extremely low output.

It is possible that the ministry expected that the miners and mine construction workers, brought together under a single "roof", would cooperate more closely and thereby bridge over the drawbacks of despecialization. It turned out the other way round. While located in the same basin, the miners and their contractors were separated by a high departmental barrier: some were under the jurisdiction of Soyuzhakhtostroy, and others directly under the ministry. If, let us say, the chief of a coal production association had somehow to bring influence to bear upon the directors of a construction combine, he had to appeal to...Moscow. It bears thinking about: would it not be more expedient to have in the Kuznetsk basin a single management over all its subsectors?

We had to talk to many specialists. They feel the Kuzbass could be developed without the construction of new mines, but only by reconstructing the former mines, has not withstood the test of time. It is already clear that without breaking ground for new mines and pits, it is impossible either to strengthen the mine construction workers' base or to increase the coal extraction. What, though, has changed now? Up to now there has been no permission to break ground for even a single new mine and not one single plan for it has been implemented. The ministry took a strange stand: instead of development, conforming to plan, of a construction base for the basin, they make a practice of doling out occasional "sops", instead of assistance--promises, and instead of a precise calculation--overstated plans, which shake apart the already unstable personnel and technical foundation of the Kuzbass contractors. Incidentally, the same thing is happening to another combine--Kuzbasszhilstroy.

Last fall B.F. Bratchenko, USSR Minister of the Coal Industry, visited the Kuzbass. He looked at the development of the pioneer Nagornaya and Yubileynaya units and approved of the initiative of the miners. Praise, of course, is pleasant. But it is not clear whether it should also be taken as approval of this method of operation using one's own resources, and tacit calling for its expansion. In general, it seems that simply to praise or criticize is not quite enough for management. A minister has the possibility of making decisions and influencing the state of affairs. Even in his speech to the CPSU Obkom Plenum, however, B.F. Bratchenko never made any constructive suggestions....

According to the calculations of specialists of the Kuzbassgiproshakht Institute, if capital investments for the basin remain at the present level, in the not too distant future underground extraction will fall by another 7-8 million tons. It is necessary, to be sure, not simply to draw out the basin's coal industry, but also to develop the Kuzbass comprehensively. Problems of reconstructing the basin go beyond the framework of the region and even of the sector. At one time specific assignments were determined by the subdivisions of a number of other ministries and departments. This is right--the whole country needs coal. Today, however, it must be stated that even "their" construction workers are in a poor way, and assistance "on the side" has not proved to be significant. The construction workers of the Ministry of Transport Construction and Ministry of Power and Electrification have lagged behind particularly. Even worse, approximately 10 percent of the work of the Kuzbassshakhtostroy and Kuzbasszhilstroy combines is carried out at projects of other ministries and departments. They are even diverting the small contractor from the main business.

Delegates of the oblast party conference which took place the other day noted that the situation that has formed was caused by a lack of new mines, lagging behind in the reconstruction of the available mines and preparation of new levels and not putting breakage faces into operation on time.

It would appear that the solution to the basin's problems, and above all reconstruction of the mines, in many ways will depend on how quickly the sector's

headquarters and the central planning organs realize that the need for accelerated development of the Kuzbass is turning from a regional task into an all-union one. In the programmed plan, and this is emphasized by eminent economists, the developing Kuzbass should be just as well-known and have a similar level of management as the Baykal-Amur Mainline and the Tyumen North, with distribution to it of an increased regional coefficient and differential wages for length of service.

It is vitally necessary to solve the problems of the Kuznetsk coal basin. The longer the program of action is postponed, the more costly will be the procrastination.

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## COAL

### BRIGADE WORK HAMPERED BY EQUIPMENT SHORTCOMINGS

Moscow IZVESTIYA in Russian 28 Dec 83 p 3

[Article by P. Voroshilov: "With a Full Shovel; What Is Preventing an Increase in Coal Extraction"]

[Text] This December the excavation brigade of A. Ivantsov received what at first glance was an exceedingly excessive, unrealizable assignment. Judge for yourselves. For each of the series-produced machines in use at the coal sections at the Ministry of the Coal Industry there are norms that take into consideration their technical characteristics and objectively evaluate the production and mining-geological conditions. So then, the monthly norm for the celebrated Ural "EKG-8I" Herculean hero, operating at the strip pit of the bed with a load of rock for motor vehicle transport is 120,000 cubic meters. The directorate of the Kedrovka section proposed to the brigade that it "adopt into the plan" 160,000 cubic meters of rock and another 15,000 tons of coal.

The excavator operators willingly agreed.

The high goal was dictated by production necessity. The brigade does the stripping for a thick bed, ensuring a substantial part of the extraction for the entire enterprise. You cannot put two excavators into one stone. Therefore, the directorate's proposal was clear, they had to give the increase by their own efforts. What guided the brigade that had agreed to such an up-stepped assignment? I talked with Ivantsov. At the Kedrovsk section, Anatoliy Grigor'yevich is not just a casual person, not a newcomer. He has been working here for just under a quarter of a century. He began as a green youth, and now he is a highly skilled foreman, leader of one of the best brigades, Honored Machine Operator of the RSFSR, holder of the Order of Valorous Labor, third class. Of course, he takes close to heart concern for the collective, and is ready for the sake of the general matter to forego personal comforts. Similarly understanding their working duties are experienced machinists V. Kharychev and V. Reyter and their young assistants, recent graduates from an industrial mining school, A. Matyushev and P. Simonov. After all, though, success does not depend only on good will, with full lay-out to work.

"So we changed to integrated contracting," said Ivantsov. "Our brigade was solidly supported. Large-load vehicles were provided."

Integrated brigades at the Kuzbass open coal pits have passed the test of time. They are unique shock detachments, which are formed at the most difficult, decisive sections. It is they who ensure the highest load for the equipment, and reveal possibilities for a machine at which even the designers throw up their hands in bewilderment. These brigades hold all-union records for loading coal and rock, exceeding the established norms 1.5 and 2-fold. For this, let us note, there is usually no need for great engineering solutions, with pretensions to being scientific discoveries, nor does the need arise to fit out the crew like a sports team with only top-class experts. Everything here seems simpler, everyday and solid.

Ivantsov has a relatively new, but already well-adjusted and tested machine. The road from the stope to the terrace is well cut and lighted. Blast-hole drilling, breaking up the rock mass, is carried out 20 days ahead. The brigade is given a powerful bulldozer and drill. The motor depot regularly sends here four BelAZ's with a load capacity up to 30 tons. The operative communication with the shift chief on duty is maintained 24 hours a day. Any malfunctions are reported to the director of the section or chief engineer without delay, and they take the necessary measures.

That's all? Yes, that's all. The rest depends on the skill of the brigade, its mobility and its degree of organization. The day that I was at the section, it was engaged in preventive repair of the excavator. The norm--is three days. But Anatoliy Grigor'yevich was sure that it would be put right in two days. True, they would have to sweat a bit.

Any brigade working at a strip pit, as we know, is faced with two problems from day to day. Is everything in the stope ready for loading? Have enough motor vehicles been allotted to work without down-times? For Ivantsov, both these problems are solved positively by the directorate. You can't be idle and scoop with a full shovel. Which the brigade also does: with a yearly plan of 1.5 million tons, in the last 11 months 1,732,000 cubic meters of rock were loaded.

Output, as we can see, is significant, and the organizational trouble is paid back with interest. The fact that the Kedrovsk section is overfulfilling the plan for coal extraction is undoubtedly to the credit of A. Ivantsov's brigade. There is no grudge against the machine operator himself, either. Fulfilling the monthly contract on condition of prompt, high-quality preparation of the bed, adhering to the rules of labor safety practices and achieving the assigned level of labor productivity and saving electric power guarantees the machine operator of the excavator an average wage of up to 500 rubles per month.

The great wealth of experience of the integrated brigade form of work organization has also been accumulated at other sections of the Kuzbass. For

example, at Chernigov, an integrated section was formed--a truck convoy, operating as a single duty detail. This opens up scope for maneuvering the work force and equipment.

All the same.... I ask the chief engineer of the Kedrovsk section, A. Chursov:

"Is the directorate ready to introduce brigade contracting in full volume?"

"Unfortunately, no," he answers frankly. "It is a matter of great responsibility, and requires serious preparation."

Hastiness, of course, is harmful in any matter. The CPSU Central Committee resolution "On the Further Development and Increased Efficiency of the Brigade Form of Organization and Stimulation of Labor in Industry" particularly emphasizes the need to form brigades of a new type, integrated and all-round, to make careful preparation, to be concerned about raising labor productivity and cutting down losses of work time, to improve the system of planning and administration and to perfect production technology. There is no place here for formalism and working in spurts.

In reality, work based on a single duty detail with payment in accordance with the end result stimulates innovation, resourcefulness and initiative, contributes to reinforcement of discipline, establishes a spirit of collectivism in the brigade and motivates it to master advanced methods and the experience of the best. For example, in Ivantsov's brigade there is no absenteeism or late-coming, each one in the shift is ready to help his comrade fulfill the assignment in the shortest time, and therefore, so that nothing will have to be done over again later, losing time to no purpose and spending additional material and monetary resources. This is the general rule. But the contract imposes certain responsibilities not only on the brigade. It requires from the enterprise administration more clear-cut joining of all the related links in the industrial chain, flexible production management and its knowledgeable prediction. In this respect there are still quite a few essential gaps.

Here is a simple example. A total of 11 excavator brigades are working on vehicle transport at Kedrovsk. Only, in order to ensure their normal work capacity, every shift there must be moved onto the line 50-55 BZLAZ's, and the motor depot is capable of giving only 40 at best. This means, three excavators are doomed to full idle-time in advance. They found this way out of the situation here. The transport facilities work on the principle of averaging out, that is, everyone is short-supplied, so that there will be no hard feelings. This means that the total losses of working time are by no means reduced: it is just that 7-8 brigades are transferred onto a schedule with long cigarette breaks. Clearly, there are not enough bulldozers at the section. The machines obtained from Cheboksar, are inadequate. They must be "brought to reason" at the site, something must be changed and individual assemblies reinforced. They are at work for a shift--and being repaired for a week.

There is a great deal of muddle in the planning. For stable preparation of the breakage face at Kedrovsk, not less than 12.5 million cubic meters of rock a year must be moved out by motor vehicle transport. The assignment for the motor depot, however, is established at a volume of 10.4 million cubic meters. It is not the production need that is taken as the starting point in planning, but the actual machine park.

Thus it turns out that the section's directorate is ready for the time being to conclude a contract with two or three brigades. Not for a year, but for a month. Moreover, not for any month, but by selection. Ivantsov's brigade, for example, worked without a contract for an entire quarter at the same stope. They couldn't ensure it all the necessary things.

The troubles which have been spoken about are not of an individual, but of a general nature. Cases of glaring lack of meeting point for capacities are encountered at every step. The volume of coal extraction and stripping in the Kemerovngol' Association grows at rapid rates, but the relative significance of the vehicle transport, which directly participates in production, is continuously reduced. Where is the logic in this?

There are no miracles in the world. With respect to stripping the association just this year is lagging behind the plan by 11 million cubic meters. Due to the chronic weakness of the construction subdivisions, there is a regular breakdown in the modernization of enterprises, and a delay in opening up new deposits. The sections are equipped with increasingly powerful equipment, but the repair base is not being developed. Supply of spare parts is poorly set up, particularly for the excavators of the Izhorskiy Plant and BelAZ's. Sometimes half a shift is used up in order to replace a trivial part. At many sections there are possibilities of increasing coal extraction at the older developed areas. For this they need to be further supplied with workers and engineering and technical personnel. But there is nowhere to settle the people. The Kuzbass needs the assistance of the sectorial headquarters to solve these urgent problems.

The experiment of integrated brigades is the valuable property of the miners. Its dissemination is a major reserve for increasing coal extraction and considerably improving the work quality indicators. Today it is a question of eliminating the disproportions that have been revealed and that prevent intensification of production. These shortcomings must now be decisively eliminated. The sooner the better.

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## COAL

### SUNDAY WORK LOWERS PRODUCTIVITY IN DONBASS MINES

Moscow PRAVDA in Russian 23 Mar 84 p 2

[Article by V. Kuz'mishchev and S. Prokopchuk, special PRAVDA correspondents, Donetsk Basin: "A Stone at the Crossroads: Problems and Opinions"]

[Text] The hardest thing is to take the first step. Especially if you must decide which path to take. It is not only in folktales that a stone which predicts the future suddenly appears at a crossroad and the astonished horseman discovers what he shall find and what he shall lose on the path he has taken.

In life everything is more complicated, but the alternatives are similar. There is always an easy way and a difficult road with many surprises. In the former case, success, as a rule, is unreliable. In the second, man becomes the master of the situation, and dictates conditions.

When about 10 years ago the extraction of coal in the Donbass at the previous record rates became significantly more difficult because of increasingly complicated geological conditions, the USSR Ministry of Coal Industry found itself, so to speak, at the crossroads. There was a choice: restructure the organization of labor, develop machines to operate under new conditions with thin seams, or recruit more people and add working days. Of course, the first way was chosen. In our age, even to mention the second alternative is unseemly. And for a time, it was not mentioned....

There were bold projects for the development of modern equipment—even equipment of the future. But although the Ministry of Coal Industry has an entire sector of coal machinery building, the path from a design to a model—to say nothing of series production—proved to be far longer than they had figured in sector headquarters. PRAVDA has written more than once why this occurs. The subject is something else.

Starting in 1970 the sector began to lean toward the second path: more and more Sundays became workdays for the Donbass miners. Such is the perplexing dynamic of growth. Nine Sundays were worked in production in 1970, 13 in 1975, 40 in 1980, and 54 so far in 1983—virtually every Sunday. Approximately 10 years ago telegrams were sent requesting [permission] to work on several days off; since 1978, however, some of the Sundays have simply been scheduled as work days.



So what is going on? Can it be that modern equipment has not come to the mines after all of 15 years? Why this need for constant storming? Yes, there are still more problems in the coal machine-building industry than there are accomplishments, but nevertheless, the mines have been outfitted every year with increasingly more productive equipment. Last year, 85 percent of the equipment consisted of mechanized timbering, narrow-grip combines, and cutter-loaders--the most advanced coal-mining devices today. Can it be that people have to be put into the mines on Sundays because of a shortage of personnel? But the number of miners is growing steadily, and at present exceeds the planned force by 10,000.

This means there is something with which to work, and someone to do the work. In that case, why is coal production declining in Donbass, and why must the shortfall be made up on weekends? Such a question might be posed by a dilettant, because the specialists have long since ascertained for themselves that the reason that the output has declined is because people have to work on their days off. Thus, that what we are taking to be the consequence is in fact the cause of many a mess. Perhaps not the main cause, but one of the basic ones.

Let us try to determine how the medicine came to be the cause of the disease. At first, those rare working Sundays made an appreciable boost. The effect was achieved without any effort or investment, if a certain inner struggle with the conscience is not counted, inasmuch as one had to come into conflict with the Labor Code. As production on Sundays rose, it began to fall on workdays. The number of Sundays worked rose by 3.5 times the 1975 level, but the average monthly number of outputs has not increased. Indeed, 12-14 workdays above the planned balance can be entered on the credit side of continuous production, but the other 40 are made up through compensatory leave and absenteeism by workers themselves, as attested by the inexorable statistics.

How does all this take place in practice? From economic heaven, let us come down to earth, and even down below it. Working on Sundays has required the scheduling of workers not for 6, but 7 workdays. As a result, in a year's time 2,500 fewer men went to work at 250 mine-faces. The section chief or brigade leader frequently does not even know who will be on shift today. The work order shows that Ivanov decided to take time off in compensation for last Sunday, while Petrov had to go to his mother-in-law's for a name day [celebration], and he decided to take the day off in advance for next Sunday. And Siderov had urgent things to do in his garden. And what are you going to do to him anyway, if tomorrow you are going to have to beg him to work on his regular day off? And what moral right does a supervisor have to call his subordinate to account when he himself is breaking the law by declaring Sunday to be a workday? That is why the collective becomes unmanageable.

In which mine does this take place? In most of the Donbass mines. Even in those which are keeping up with the plan on workdays, where labor is organized very well and the equipment is functioning with top capacity. For example, Krasnogvardeyskaya Mine of the Makeyevugol' Association, and the Imeni M. Gorkiy Mine of Donetskugol.' Why? In the first place, the order applies to

everyone. In the second place, it is necessary to pull his lagging neighbors out of the gap. Third, it is wrong for the leaders to earn less than the laggards. However, this contradicts common sense: at those mines where there is disorder and low production volume is made up for by working on Sundays, wages are higher. Wages for these days are double those of regular workdays. Overtime pay in 1 year alone amounts to about 120 million rubles. A rather substantial addition to the already prime cost of Donetsk coal.

So is there something worth paying for? Surely it is not accidental that Sundays are declared to be "days of increased coal production." But again the statistics contradict this. According to data of the Donetsk Scientific Research Coal Institute, production on Sundays is substantially lower than on work days, with the disparity increasing over the years. In 1975 14 percent less coal was produced on Sundays than on workdays; in 1983, 24 percent less. Bear in mind that the average daily output for the same period declined by 18 percent.

Behind this latter figure is that same unmanageability, engendered by the semilegal practice of continuous operation.

Does this word not sound strange, in reference to mines? It has nothing to do with the characteristics of the technology, as it does in the case of chemical and metallurgical workers. It is, on the other hand, related to other not very encouraging figures. Since the introduction of the continuous production schedule, the number of absences has quadrupled, and is growing every year. The number of absenteeism-related dismissals has also grown, of course, by a factor of two. But to strengthen discipline, what is needed is an objective basis--precise and uncompromising compliance with mine operating hours and shift schedules. How is this to be drawn up, if there are, officially, no Sunday workdays: miners are accounted for 306 workdays, not for 350. Anyway, the schedules must be set aside so long as, on Friday or Thursday Minugleprom USSR sends out the obligatory telegram: "Because of production requirements, Sunday is to be considered as a workday." Many of those mine directors that we talked to were under the strain of the uncertainty, were tired not only from eternally waiting for the telegram, but also physically tired. Whereas workers have compensatory days off, directors work every day.

There is another very serious problem caused by continuous production. Prior to the beginning of the "experiment," days off were devoted to repair and preventive maintenance of the equipment, vehicles, mine workings and shafts. Now there is not any time for that. Repair and preventive maintenance are done hastily, or put off "until later." Repairing the mine shafts, for example, requires three or four shifts in succession--that is, days which most mines do not have to spare.

The lack of time for repair has increased the number of breakdowns and work stoppages, and hence losses of coal. In a 10-year period, work-time losses have increased by 1.3 times in the mines of the Ukrainian Ministry of Coal Industry, and doubled in the Makeyevugol' Association. Investigations have shown this to be a direct consequence of insufficient attention to equipment.

Thus, working on Sundays has only covered losses on regular workdays. But lately the losses have exceeded Sunday production. Because of work stoppages, absenteeism, breakdowns--specialists have calculated that 21 million tons of coal are lost per year. But we have also lost more--above all the high conscientiousness and discipline, for which the Donbass miners always had a reputation. The organizational muddle, which is inherent to storming, is only advantageous to would-be executives who try to cover their own blunders with an endless "c'mon! c'mon!" Working all week in a slipshod manner, it is advantageous to them to cover shortcomings with Sunday production and reporting it as 6 days. And still more to those workers who, having worked their day off underground at double pay (productivity on these days, remember, is much lower) take off any other day with impunity.

The remedy? There was a similar situation back in the fifties. Then, in the Donbass, they rejected non-stop production and changed over to the new schedule. The output fell at first, but then work took an upward turn thanks to increased labor productivity on regular work days, better organization and discipline, and better care of equipment. As the experience of leading enterprises has shown, other alternatives are possible.

For example, the five-link method [pyatizvenka]. Three days on, and two days off. Most often on a sliding schedule. Quite a few mines of the republic are working on this schedule now. But this is, in effect, the very same continuous production schedule borrowed from the metallurgists. Moreover, it can be adopted only by those who produce above-plan amounts of coal, and therefore can afford to maintain about 20 percent of the people. It is a luxury which shall long remain an "idle dream" of most collectives.

The most reasonable way out, in the opinion of many of those with whom we met in the work-faces and offices, is to decisively do away with continuous production and convert to an operating schedule with one common day off on Sunday. Let Sunday be put fully at the disposal of the repair crews. It is time, finally, to enable them to really get involved with restoring the mine inventory, the equipment, etc., to guarantee that they will work stably for the whole week.

At first, of course, coal production may go down, and wages too, in some cases. But this will no doubt be compensated for by better organization and higher productivity. Specialists have already set up the switch to this schedule in stages, so that there would be no sharp decline in output.

About 10 years ago Minugleprom USSR took the path that guarantees easy, though specious, success. It has now become clear that it has not succeeded in increasing output. This means we must find the courage to turn away from this path. The hardest thing is to take the first step.

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## NUCLEAR POWER

### LENINGRAD'S ROLE IN SOVIET NUCLEAR TECHNOLOGY DESCRIBED

Moscow TRUD in Russian 13 Feb 84 p 3

[Article by I. Glebov, chairman of the Interagency Coordinating Council, AS USSR: "The Peaceful Atom"]

[Text] Leningrad has long been called, and rightfully so, the city of scientific and technical progress. It has played a significant role in the development of such important sectors of the economy as shipbuilding, instrument building and machine building. But today, a new and promising sector is becoming ever more visible: nuclear power.

In recent times, nuclear power has become the fastest-growing link in the fuel-energy economy of the world. There are around 300 nuclear power stations (AES) presently operating in the world with a total installed capacity of about 160 million kilowatts. AES's produce about eight percent of the world's electricity. By the end of 1985, this will reach 15-17 percent.

The intensive growth of this new sector is due to three factors: the present world-wide trend of constant growth in energy consumption, a noticeable decline in mineral fuel reserves and price increases in traditional energy sources such as oil, gas and coal. And, although the USSR has enormous organic fuel resources, getting them to the power plants is a serious problem in our country. The problem is that the main organic raw material resources are located in the eastern part of the country, while 80 percent of all electricity is consumed in the European part and in the Urals.

According to the basic directions of the country's economic and social development, confirmed by the 26th CPSU Congress, new generating capacities are to be put on line at the Smolenskaya, Kalininskaya, Kurskaya, Yuzhno-Ukrainskaya, Khmel'nitskaya, Zaporozhskaya, Krymskaya, Chernobylskaya, Rovenskaya and Ignalinskaya AES's. An ever greater scale of nuclear power growth is contained in the country's Energy Program, which is often and justifiably called the second GOELRO plan.

The tasks of these most important national-economic plans are being successfully fulfilled. The Soviet Union, having opened the era of the wide use of peaceful nuclear energy, has solidly confirmed its leading



scientific and technical position. For instance, at the Ignalinskaya AES, in the Lithuanian SSR, the 1.5 million-kilowatt main power unit was put into operation.

This is the world's largest nuclear power unit. Several of the country's AES's have had 1.0-million kilowatt power units in operation for several years.

Nuclear power stations in the USSR are conceived as large power installations with an eventual installed power capacity of 4-6 million kilowatts. The path taken by our country toward large power units has produced lower AES construction costs and lower-cost electricity.

Over the near term, the AES's to be built in our country and abroad will be equipped with thermal reactors. The principal disadvantage of these reactors is that they utilize less than one percent of the uranium ore. Such extravagant ore consumption could cause a shortage of nuclear fuel even in the foreseeable future, similar to the shortage of organic raw materials in a number of countries. This is why scientists are now developing reactor designs which can use the nuclear fuel more efficiently and for a longer period of time. In about two to three five-year plans, fast breeder reactors will be in wide use. Switching over to these reactors will ensure the uranium supply for mankind forever.

Our country is now the only one in the world with three operating AES's with fast breeder reactors. Among these is a 600,000-kilowatt breeder reactor--the largest in the world.

An important feature of the development of our country's nuclear power is that it has occurred in the framework of international socialist cooperation with the CEMA countries. There are now 12 operating power units in nuclear power stations in the GDR, Bulgaria, Czechoslovakia and Hungary with a combined power of over 5 million kilowatts. These stations were built with the assistance of the USSR on the basis of Soviet technology. The basic equipment was supplied by our country.

Nuclear power will also be developed in Romania, Poland and Cuba. The participants in this collaboration have begun producing nuclear power equipment. For instance, a Czechoslovakian reactor has been installed at the Paksh AES in Hungary. Besides the USSR, a number of other socialist countries participated in the manufacture of important components of the power plant. Fifty of the largest production collectives of eight countries are now taking part in the realization of a large-scale, multifaceted agreement on nuclear power development.

The greatest contribution to nuclear power in our country and in CEMA countries is from the Leningrad industry and from research and design institutions in the city on the Neva. A distinguishing feature of the work done in Leningrad is its wide spectrum: from fundamental research in nuclear physics and the development of original nuclear power plant designs



to the manufacture and supply of a wide range of AES equipment and structures for the largest nuclear power plant in the country: the Leningrad AES imeni V. I. Lenin. It must be noted that the most important fundamental research in nuclear power is being done in Leningrad under the scientific leadership of and with the direct participation of the Nuclear Power Institute imeni I. V. Kurchatov, headed by Academician A. P. Aleksandrov, president of the AN USSR.

Over 50 large Leningrad enterprises and organizations in various sectors are working on the problems of nuclear energy development. Half of these collectives are scientific-research and design institutes. The industrial enterprises include such giants of the domestic power machine building industry as the Izhorskiy Zavod, Elektrosila and Leningradskiy Metallicheskiy Zavod production associations.

During the 10th Five-Year Plan, Leningrad supplied equipment for domestic AES's having a total output of over 20 million kilowatts. It is noteworthy that this new industrial sector in the USSR--nuclear power machine building--was born at the Leningrad association, Izhorskiy Zavod. The city was the cradle of the revolution and can rightly be called the cradle of nuclear power machine building. Nine Leningrad-designed AES's, with a combined power of 12 million kilowatts, have been built and put into operation. The All-Union Scientific-Research and Design Institute of Complex Energy Technology (VNIPIET) and the Leningrad departments of the Atomteplou-elektroproyekt and Hidroproyekt institutes have distinguished themselves in this work.

In this five-year plan, Leningrad collectives are strenuously working to solve the problems of nuclear power growth. Today, all working being done by the participating organizations and enterprises of many sectors is in the framework of a unified, complex program approved by the Leningrad CPSU Obkom entitled "Increasing the Efficiency of the Country's Fuel-Energy Complex." The daily coordination and control of the work is being handled by a special staff of the Economic and Social Development Council of the Leningrad CPSU Obkom, with scientific advice on power technology problems from the Interagency Coordinating Council of the AS USSR in Leningrad.

As a result of the well-tuned cooperation of all the Leningrad collectives participating in the realization of the complex program, the manufacture and supply of all the domestic and foreign AES's over the past three years of the five-year plan have been fulfilled, mostly within planned deadlines. The plans for AES design are being successfully fulfilled.

The fulfillment of all these planned tasks is being done in Leningrad on the basis of regional cooperation in design work. No matter which Leningrad organization is named general designer for one AES or another, the development of technical documentation for erection and installation of reactor buildings is done by VNIPIET specialists, who are the most qualified and experienced in this type of work. This cooperation has

reduced the time needed to design a power station by a half-year, has improved the quality of design decisions and ensures that AES's under construction will be put into operation ahead of schedule.

That, in general terms, is the present state of our nuclear power industry and this is the contribution to its development that has been made by the scientists and workers of the Leningrad industry. The doors to the country's power industry have been opened wide for the peaceful atom.

12595

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## NUCLEAR POWER

### DECISION TO TRANSFER TURBINE PRODUCTION QUESTIONED

Moscow IZVESTIYA in Russian 7 Feb 84 p 2

[Article by Academician L. Melent'yev, Hero of Socialist Labor, and Ye. Sokolov, doctor of technical sciences, professor, winner of the Lenin Prize and the USSR Council of Ministers Prize: "A Mistake Can be Prevented"]

[Text] Construction preparations for large nuclear heat and power stations (ATETs) in the European part of the USSR are part of the implementation of the decisions of the 25th and 26th CPSU Congresses and the Energy Program. One of the most important tasks in this work is the development of heat and power turbines.

For several years, the staff of the design bureau of the Sverdlovsk Turbomotornyy Zavod Production Association (TMZ) worked on designing the largest heat and power turbine in the world: the TK-450/500-60, which has a rated power of 450,000 kilowatts. The brainchild of the Urals designers was approved by the scientific-technical committees of the USSR Ministry of Power and Electrification and the USSR Ministry of Power Machine Building. The working drawings for the turbine are basically finished. Much preparatory work has also been done by the technological and other production divisions of the association. Designers of the Ministry of Power and Electrification have selected the Sverdlovsk turbines for the first ATET's in Odessa and Minsk. Construction of these stations has begun. But, after preparations for turbine production had begun, it suddenly became clear that the Sverdlovsk plant was not sufficiently prepared for the task--the plant did not have sufficient production capacity.

Instead of offering the plant some help in removing bottlenecks and organizing production, the Ministry of Power Machine Building decided to transfer production of the ATETs turbines to the Kharkov Turbine Plant, although they had no experience in building this kind of turbine. In addition, the Kharkov plant refused to build a turbine designed in Sverdlovsk. Instead, they offered their own condensing turbine (which has increased, unregulated steam bleeding) for the ATETs.

This decision, for all practical purposes, wiped out years of work by many plant personnel and design and scientific organizations in creating ATET's based on specialized turbines. The construction deadlines for these first ATET's were broken. As for the two "competing" turbines, the following may

be said: both can find useful application, depending on the specific situation. However, they are not interchangeable.

For cities that have high heat loads and limited water supply (characteristic of most regions in the European part of the USSR). It is more expedient to use the turbines of the Sverdlovsk TMZ. For regions with low heat loads, high electricity loads and sufficient water supply, the Kharkov turbines can be used. It is also impossible not to take into account the specialized talents of the plants which was gained during the development of the domestic turbine building industry.

TMZ is the leading factory for designing and producing large heat and power turbines. Almost half of the installed power in the heat and power stations of our country consists of turbines produced by the Sverdlovsk workers. A qualified, creative staff of designers, technologists and production workers has developed here. The staff has repeatedly shown the ability and know-how to create highly efficient products which are on the level of world practice. The TMZ design bureau alone presently has nine Lenin and USSR State Prize winners and seven candidates of science.

Transferring the production of heat and power turbines for nuclear heat and power stations away from the Sverdlovsk TMZ means that the staff has been taken off work on the present tasks of developing heat and power turbines. This decision will weaken the qualifications of the plant's design staff and lead to the loss of their unique experience in creating highly efficient, large heat and power turbines. From the government's point of view, it is completely unjustified to destroy a highly qualified, creative design staff working in a very important energy field.

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## NUCLEAR POWER

### ADVANTAGES OF NUCLEAR HEATING FOR CITIES DISCUSSED

Moscow PRAVDA in Russian 30 Jan 84 p 7

[Article by V. Gubarev: "Hooray for the Easy Steam!"]

[Text] Science: The Search on Your Behalf --

Right off there were freight trains of coal. You could set your clock by them: every 15 minutes a rising rumble could be heard--a train was passing over a bridge over the Moscow River, the trusses hummed, and then the squeal of brakes could be heard....

I lived near a TETs for about 10 years--a gigantic "furnace" that heated a district of the large city. It swallowed up trains of coal and oil. A comparison with a Moloch, an insatiable monster, came to mind involuntarily. True, the 20th Century Moloch did not require human sacrifices, but it still burned the fruits of the labor of many thousands of miners and railroaders, and power and oilfield workers. The city wanted heat, and the Moloch gave it.

But then three decades ago the world's first nuclear power station went to work at Obninsk, near Moscow. A small stream of steam came from the stack, giving notice that the power of the atom had received its first job assignment.

"Hooray for the easy steam!" is how I. V. Kurchatov greeted his nearest comrade-in-arms, A. P. Aleksandrov. These words were fated to go down into history, like Gagarin's legendary, "Let's go!"

"Hooray for the easy steam!"--so began the construction of nuclear power stations.

Just like the founding of a basically new industry, nuclear power went through all the stages of development--a period of controversy, discussion and studies, and then the stage of establishment and, finally, a period of accelerated development. And while there were still many skeptics several years after the appearance of the first AES, skeptics who considered that nuclear power could not compete with ordinary power, they have now practically disappeared: excellent power reactors have been built, and the stations based on them are



reliable, economical and high in power. And, if it is added that, aside from having reliable safety, they are, moreover, "cleaner" fuels--they do not pollute the environment, then it is clear why nuclear power is being developed at an accelerated pace.

Nuclear reactors have won themselves "a place in the sun." But are their capabilities being used fully?

"Approximately one-fourth of all the electricity consumed now goes to electric power. The remaining three-fourths go to generating heat for industry and households, to transport, and, finally, to metallurgical and chemical processes," says Academician A. P. Aleksandrov. "The generation of steam and heat for industrial and household purposes, just like in traditional electric-power engineering, is easily tied in with nuclear power. It is clear that the development and expansion in every possible way of industrial processes, the heat for which can be furnished by nuclear power, is one of the most important tasks."

But how, then, can one help but recall: "Hooray for the easy steam!"? Can't this steam be used for a direct purpose--for heating our housing, for household needs?

The nuclear stove burns. To put it to work, the heat must be carried away, the water or steam is cooled and again sent to the stove....Why not "cool" the water or steam in the radiators of our apartments?

But the atom has not only been lighting but also heating for a long time now. In 1964 the Beloyarskaya AES was started up, and at once the heat born in the reactor was used for district heating in a settlement.

The young engineer G. Veterennikov came here when construction was in full swing. He is now in charge of the Soyuzatomenergo Association.

"My colleagues and I were engaged in heating the settlement," he said. "What did we have to fear? It was not clear then how the heating line would behave, whether it would manage to carry polluted substances in case of a reactor breakdown, for example. And the specialists took a look at the options--incidentally, most of them remain as proposals, for, I confess, we were overcautious. Then the first, fundamental idea was born--to see to it that pressure gradients are directed toward the reactor. In that case--even during an accident!--the polluting substances would not fall into the heating grid.

The first reactors and the first doubts....Now the reliability and safety of AES's have been proved, and not only in theory, for they have also been provided for in practice. Among them were AES's used for district heating--the Beloyarskaya and Voronezhskaya AES's, and then also the one at Bilibino. And now one can say that nuclear power can be designed for ordinary purposes and for district heating. However, in my opinion, one cannot speak about competitiveness. Actually, the atom does not oppose coal and oil, it enables them to be used more effectively and wisely. For, with the use everywhere of nuclear heat and power centrals (ATETs's) and nuclear heat-supply stations (AST's), one can save as much as 40 percent of the fossil fuel.

The modern nuclear station generates heat as well as electricity. So why is the district heating of cities coming onto the agenda just now?

It turns out that the guilty one is... "the spider." Some terms that the specialists use are not, at times, entirely ordinary. "The spider" is the system of urban district heating which, in layout, actually reminds one of a spider.

Before starting to build the first ATETs, the city where it will be erected must be chosen. Consequently a multitude of factors are assessed. One of them is that the city's district-heating system should be modern, and that means improved. "The contest of the cities" showed that not all of them had heat-supply routes that would accept heat from an ATETs--they were obsolete. Odessa proved to be the most suitable candidate, so they began to erect near it a prototype ATETs, the first of a series of nuclear heat and electric-power centrals.

Four trunk pipelines were extended from the ATETs to Odessa. The temperature of the water sent to the city is 150 degrees. When it cools off to 90 degrees it is returned to the station. The heating season is 168 days, and, according to the meteorologists' data (their opinion also was considered when the construction site was chosen), for 81 days per year the average daily temperature in Odessa is zero degrees or lower.

The Odesskaya ATETs not only heats the city--it eliminates a shortage of electricity.

This is a most modern nuclear electric-power station. Two VVER-1,000 reactors of a million kW each and two turbines and two generators manufactured at Leningrad's Elektrosila will be installed at it.

The pressure of the grid water is higher than that of steam, and, moreover, special gate valves are called for that will operate if radioactivity suddenly appears. Thus, additional safety measures are taken at ATETs's that are not needed at nuclear power stations that use VVER reactors. As is known, this reactor has two cooling loops: the first carries heat away from the core, the other transmits it to the turbines; the second loop is not radioactive.

But let's say the heat stops coming from the ATETs for some reason, and it is cold outside. When a TETs stops operating in a large city, only the district will suffer, but what if there is only one boilerhouse?

Such an eventuality is foreseen: ordinary boilerhouses will not be dismantled. They will be preserved for use. First, if the heat from an ATETs actually stops arriving for some reason (although it is difficult to imagine that such a thing can happen!), then the "obsolete" reserve boilerhouses will be switched on. And, second: a bitter cold can so exceed the ordinary that right away there will not be enough heat--the boilerhouses can eliminate the deficit, and they will take on the peak load.

The ATETs combines both functions: it produces heat and electricity. However, in some cases, using those same VVER reactors, it is more suitable to be

limited just to producing heat and hot water. Designs for nuclear heat-supply stations (ATS's) have been created, construction on the first of which has started at Gorkiy and Voronezh.

A small city with a population of about 300,000 requires up to 1,000 gigacalories each hour, and this means that many boilerhouses must burn 400 tons of mazut. This is only for domestic needs, but indeed industrial enterprises also need heat....

Nuclear boilerhouses can compete effectively with ordinary ones. Well, the scheme for a nuclear boilerhouse is similar to that of an ATETs, except that fewer fire-resistant materials are used in it.

Niels Bohr once said that he views the nuclear reactor as he does a wonder. One of the creators of the nuclear century, he did not suspect then how great the potential of this wonder was--modern science and technology are constantly demonstrating that the nuclear reactor is capable of carrying out the most diverse work.

"You have no doubts that the future of the ATETs is in district-heating for cities?" Academician A. P. Aleksandrov and Soyuzatomenergo chief G. A. Veretennikov answer this question.

"Even in the not-so-distant future it will be desirable to build such stations in several hundred of the country's communities," A. P. Aleksandrov considers, "since they will enable a large amount of oil to be saved, equal to a third of the daily recovery thereof, and, the main thing, nuclear heat will be half as expensive as the heat given by boilerhouses that operate on fossil fuel."

"Nuclear boilerhouses," G. A. Veretennikov shares this opinion, "are a great achievements of domestic science and technology, and they will appear in many cities. However, it must be remembered that basically new directions of technical progress require of all branches of industry an attitude different from the traditional one, the ordinary one. Our country has developed excellent designs for reactors, apparatus and instruments--all the components of nuclear power engineering. But the quality of the manufacture of parts and components leaves much to be desired. The equipment that arrives at our construction projects must be inspected thoroughly: specialists are compelled to disassemble it, check the tolerances, change the lubrication, and so on. Much effort and resources are spent on refinement, but this can indeed be avoided if, during manufacture, the highest quality is observed."

Comrade Yu. V. Andropov said at the June 1983 CPSU Central Committee Plenum: "The future of our power engineering lies primarily in the use of the newest nuclear reactors, and, in the long term, also in the practical solution of the problem of controlling thermonuclear fusion."

Not just physicists and the specialists who create nuclear equipment must bring this future closer, it goes without saying. That which is new in science and technology is not just the idea of the scientist or the flight of the designer's thoughts. There is also the psychological restructuring of many people who, it would seem, do not have a direct relationship to it. In

order that nuclear boilerhouses may save us millions of tons of oil and coal and protect the air of our cities from pollution, municipal-services officials also must do a lot of work. In laying heating lines to new microrayons today and repairing those already in operation, it must be remembered that the time is not far off when the atom will be heating housing, and that means we must get ready for it ahead of time.

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## NUCLEAR POWER

### PROGRESS IN BUILDING BALAKOVO NUCLEAR POWER STATION UNEVEN

Moscow SOVETSKAYA ROSSIYA in Russian 6 Mar 84 p 1

[Article by Yu. Burov (Balakovo, Saratov Oblast): "Not Everyone Is in Step"]

[Text] How the builders of the Balakovskaya Nuclear Power Station are meeting their socialist commitments.

The builders of the Balakovskaya Nuclear Electric-Power Station have undertaken a commitment--to introduce the first 1-million kW power unit into operation ahead of schedule and with high quality. This facility is also mentioned for startup in the commitments of the Russian Federation. How are matters going today?

It is not difficult today to examine the outlines of the future building where the first reactor of the Balakovskaya Nuclear Electric-Power Station will be located. The framework rises up before one's very eyes. The installers have been working alongside construction brigades here for a long time now. All the work is divided into stages, and the duration of each is computed carefully. We are walking along a corridor with installers' brigade leader N. Oseled'ko. The place is tangled up with welding wires and lengths of pipe for pipelines.

"We have completed the equipment for the third floor," says the brigade leader. "Then we will lay a bridging from the framework to the reactor department. Still to be laid are tens of kilometers of pipe. But we will turn over on time the premise being erected for the equipment installers, we will not let down the workers who depend on us."

The brigade leader's assurances are not simply cheery words. Last year the Saratovgesstroy [Saratov Trust for the Construction of Hydroelectric-Power Stations] collective overfulfilled the construction and installing work plan, and it was enriched by good experience. For example, the section in which the general construction brigades operate transferred entirely to contract work last year. The method has justified the boldest of expectations.

"Thanks to the contract, we exceeded the annual task by almost half a million rubles," says section chief Ye. Agashin. "Material incentives increased appreciably the activeness of the engineers and technicians. And the main thing, our brigade became more flexible."



And the installers have graduated from a good school of advanced work methods. N. Kravtsov's brigade has "descended" from the scaffolding to the ground, and now it assembles structure in a department. High-iron erecting is done by consolidated modules. A meaningful amount of time is saved.

The construction project brigades recently discussed at a general meeting how to speed up the pace of the work and to turn the first power unit over for operation successfully by the promised date. The workers proposed no few clever suggestions. And most of them are now being carried out. The builders are ready to transfer to a sliding schedule, so work will not stop for even an hour on Sundays. For less than 10 months remain before startup, yet the assault on the goals designated in the commitments is not being developed uniformly everywhere and there are many bottlenecks.

As before, the hydraulic installers are creating a production stopper. They have not coped with the work plan once. Because of them, the concreters often are idle and, because of that, so are the remaining cooperating workers. The causes of the hydraulic installers' lag can be seen at the facility. The subunit's performance and work disciplines are low. The brigades often spend whole hours in idleness waiting for materials. Workers find themselves doing other than the assigned tasks. The consolidated structure of the reactor pit, for example, lay without movement for more than 10 days. What's the matter? We shall explain. No one has acquainted B. Krapivko's brigade, which is charged with lifting the unit up to its high place, with the operating program, the deadlines and the pay. This is elementary inefficiency.

It occurs through the direct fault of supervisors of the Balakovo Section of Gidromontazh Trust. Their lack of commitment has already led to a lag in work on the equipment of a number of power-unit facilities. It is unreasonable to ask: have any kind of corrective measures been taken against the unreliable partners? They were the subjects of sharp rebukes at meetings, briefings and party-committee sessions. They were persistently advised to change their work style, to be energetic, to solve urgent problems in a businesslike fashion. Gidromontazh Trust supervisors Yu. Pavshinskiy, O. Ivannikov, Ye. Samul'tsev and Ya. Martenson often visit Balakovo. They are not lacking in promises and enthusiastic assurances. Weeks and months pass. But everything remains as before. Thus Gidromontazh is not in step with the startup schedule.

Recently the Deputy USSR Minister of Power and Electrification A. Semenov was in Balakovo. He required trust manager Yu. Pavshinskiy to insure that the Chekhov, Leningrad and Novaya Kakhovka Metal Structure Plants delivers to the AES output that the project should have received half a year ago. But soon it became known that even the "emergency" deadline was not being met. In some places the work has not even been started. But the wall calendar at the construction project inexorably counts off the days and weeks that remain before startup.

## NUCLEAR POWER

### LENINGRAD METALLURGICAL PLANT ENDS TESTS ON HIGH-SPEED AES TURBINES

Leningrad LENINGRADSKAYA PRAVDA in Russian 29 Mar 84 p 1

[Article by P. Sergeyev: "A Happy Moment of Victory"]

[Text] Tests were completed on the first domestic AES high-speed turbine with a capacity of 1 million watts.

For these seconds it seemed that the huge steam turbine shop had fallen still. The din of machine tools from neighboring bays suddenly ceased. Human emotion, unrest and anticipation filled the area around the test stand. For each person who stood next to the turbine during these minutes, only the commands from the "captain's bridge" were important; only they were discernable--laconic but with so much meaning.

"Warm up!" "We have warm up!"  
"Vacuum!" "We have vacuum!"  
"Open valves!... Give steam!..."

The "captain" at the stand was the foreman of the test program fitters I. A. Dekun. For him, this was not a first to test the unique machines. He had done the testing for the 1.2 million kilowatt unit for the Kostroma GRES [State Regional Power Plant]. And here, this time, the veteran was entrusted with the control lever that resembled a pilot's control stick, and it was he for the first time who could exclaim:

"Let's go, old girl!"

Hidden under a huge housing the turbine started its first run. It was impossible not to feel its accelerating movement. Fifty revolutions a minute, 100, 200, 500, 1,000.... And then suddenly the instrument needles dropped back.

"Is something out of order?" The less experienced testers looked questioningly at their foreman. His look conveyed to all his answer, "No, everything is in order." Really, it was best to check at this speed whether there were vibrations, binding or other undesirable deviations from the norm. Judging by how the specialists were calmly looking at the many gauges, there were no deviations.

In a half-hour the machine again started to pick up speed.

The tension dropped away; people were already smiling. Someone playfully even asked Dekun:

"Well, Ivan Alekseyevich, can we be congratulated?"

"Don't say anything yet! The turbine still has an hour to turn...."

The chief of the test program fitters' station V. N. Aleksandrov, although he could not hide his satisfaction from his face, also let out some stern words:

"The test for the unit is continuing; everything here is new, so we won't rush our conclusions."

He is right. It's true that this unique test stand was built specially for a new series of turbines and as a matter of fact was tested simultaneously with the first atomic million kilowatt unit intended for the Rovno Atomic Powerplant.

What can we compare them with--this powerful machine in its gigantic cradle? Maybe we can compare it with a space station, that has not yet left its shop walls. The scale is great as is the technical complexity; the design solutions are elegant. However, the general director of the firm A. P. Ogurtsov in our conversation the day before the tests proposed another comparison--with an iceberg.

"Only an insignificant portion of what the collective accomplished with the help of their suppliers," he explained, "is on the surface visible to the eye."

Perhaps this comparison is more precise. One has only to list several examples to become convinced of this. Not days and weeks but a year and more have gone into the production of such large size units like low-pressure rotors. To make them, metallurgists of the Izhorsk plant produced for the first time in our country four ingots weighing 235 tons each, and they provided the possibility for the first time of making such rotors seamless, without welding. The shops of the Turbine Blade Plant associations also were trail-blazers. They supplied the metalworkers with blades which nobody in our country had previously produced; they were blades of a super-durable alloy. There are substantial examples of innovation to the credit of the TsKTI (Central Research and Design Institute for Boilers and Turbines) imeni Polzunov, the All-Union Design-Engineering Institute Energomash and other collectives.

But let's go back to the stand in the steam turbine shop of the Leningrad Metallurgy Plant. Next to I. A. Dekun and his comrades some other men from other brigades continued to stay on. Victor Kazantsev's assemblers who only recently had put together the stand equipment watched to see whether everything was working normally. V. N. Bel'skiy's welders were also concerned

if any other help was needed. It had fallen to them to apply, one might say, the final touches to the turbine, and, therefore, they still considered themselves responsible for it. Also here were designers from the SKB (Special Design Bureau) Turbina and plant engineering workers.

Although the road to the long awaited victory was not, of course, just a triumphant march for any of them, each worker could recall at this time many happy events connected with the million watt unit. Engineers, for example, last July joined the experiment to perfect the payment of labor and labor organization. This permitted them for probably the first time to avoid complaints about the lack of manpower to solve the complicated technical problems. An example was the specially set-up small brigade of specialists with V. I. Ivanov in charge that undertook to provide the machine operators with the technical equipment that would withstand the extremely compressed time periods for processing the unique rotors. The brigade was able to achieve much more; the process cycle was reduced by 27 days!

...And still, it was impossible to dispense with congratulations. Towards 3 o'clock in the afternoon the machine, having completed the complete program of tests and not requiring additional measurements, reduced speed and then stopped completely. The specialists quickly gathered their notes for careful study. No matter how hard they tried, they couldn't restrain themselves from complimentary comments: "It's an excellent machine!" The opinion was unanimous.

There were handshakes and back-slapping. Even the usually reserved I. A. Dekun was smiling. However, when the time came to say good-bye to one another, he again put in his "Don't say anything, yet." What he said was correct. The machine can slow its revolutions and stop, but the turbine builders can't do the same. They are faced with much too great tasks. Only the first step has been taken in the mastering of a series of atomic "million watters." Now, after the Rovno unit, production of the same type of turbine for the Khmel'nitsky Power Plant is in prospect. Work on it has already begun, but its tempo must be substantially speeded up.

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## NUCLEAR POWER

### PLANNED DEVELOPMENT OF NUCLEAR POWER STATION IN AZERBAIJAN

Baku VYSHKA in Russian 5 Apr 84 p 2

[AzerINFORM article: "The Atomic Power of Azerbaijan Is Being Born"]

[Text] "...Assure the growth of electric power production in the European part of the USSR, primarily at atomic and hydro-electric power plants." (From the Main Directions of Economic and Social Development of the USSR).

Power production in Azerbaijan is entering a qualitatively new phase of its development; in accordance with a decision of Gosplan, USSR, the planning of an atomic power plant has started. It is planned that the plant will go into operation in first year of the 13th Five-Year Plan.

In the not too distant future the new plant's reactors will rise above the expanse of the steppe and will begin to put the energy of the peaceful atom to the service of people. Start-up of the Azerbaijan AES will significantly increase the capacity of the republic's power network and will permit more complete satisfaction of the growing demands for electric power by the intensively developing industry of Azerbaijan and the satisfaction of the every day power needs of the population.

Thirty years ago the first atomic power plant in the world began operating in the USSR. Its operational history has shown the practicability of using atomic energy for the industrial production of electric power. The list of atomic power plants over recent years has substantially grown. Now Azerbaijan as well, which at the beginning of this century got its first power plant, will become a republic with nuclear power.

The construction of the Azerbaijan plant has been entrusted to subdivisions of Soyuzatom-Energostroy of the Ministry of Electric Power and Electrification of the USSR, which includes Azenergostroy. Planning operations must be completed by the first half of 1985. Construction of the plant will begin at the beginning of the 12th Five-Year Plan.

The Azerbaijan plant, whose nuclear powered output will provide the possibility of resolving the republic's electric power development problems



without increasing the consumption of organic raw materials in short supply, is assigned an important role in supplying electric power to the entire Trans-Caucasus region. It will be connected to junction substations of the power network by four (LEP) electric power transmission lines. Although the plant's start up is far off, power engineers are faced with the need to solve many problems well in advance, including the manpower problem. Personnel training for the plant will take place at various nuclear plants across the country.

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## NUCLEAR POWER

### BRIEFS

**NUCLEAR PLANT AGREEMENT SIGNED**--Sofia, 27 Mar (TASS)--Talks were concluded, and a Soviet-Bulgarian inter-governmental agreement on cooperation in the construction in Bulgaria of the Belene Atomic Power Plant was signed here today. The agreement was signed by Ya. P. Ryabov, Chairman of the State Committee for Foreign Economic Relations of the USSR and Kh. Khristov, Minister of Foreign Trade of the NRB (Peoples Republic of Bulgaria). It has been stipulated that the Soviet and Bulgarian organizations will cooperate in the construction of an atomic power plant with VVER-1000 [water cooled] reactor units. The General Secretary of the BKP Central Committee and Chairman of the State Council of the NRB T. Zhivkov received Ya. P. Ryabov. During the course of their meeting which was held in a warm and friendly atmosphere, questions of Soviet-Bulgarian economic and technical cooperation were discussed. [Text] [Moscow PRAVDA in Russian 28 Mar 84 p 4] 8750

**KURSK ACHIEVES DESIGN POTENTIAL**--The third power unit of the Kursk Atomic Power Plant has reached design output--1 million kilowatts. This took place 1 month earlier than planned. The new power unit, put into operation last October, has already produced more than 2 billion kilowatt-hours of electric energy. The Kursk plant has played an important role in the formation of the territorial-production complex based on the mineral resources of the Kursk Magnetic Anomaly, and also in the development of the agro-industrial complex of the Central Chernozem region of Russia. [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 31 Mar 84 p 1] 8750

**SUPER-CRANE AT BALAKOVO**--A super-crane has undertaken its first job at the Balakovo Atomic Power Plant construction site. It is capable of hoisting a 360 ton load to the height of a 25 storey building. The giant unit was manufactured for the plant according to the plans of Kharkov specialists at the Zaporozhye Power Equipment Plant. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 7, Feb 84 p 5] 8750

**ARCTIC NUCLEAR PLANT RECONSTRUCTION**--Reconstruction has begun of the Bilibino Atomic Power Plant, the first built in the north-eastern part of the country. The plant has provided electric energy to mining enterprises and villages of the Arctic for 10 years. It is here that a unique experiment came to life. The plant began to supply the village of Bilibino with heat in addition to light. The effects of this surpassed all expectations. It has now been decided that the plant will also heat a greenhouse complex, the first

part of which is about to go into operation. It has been proven by specialists that an atomic source of heat supply has another advantage: it is absolutely safe for people and the environment. [By R. Bismukhametov, staff correspondent (Magadan Oblast)] [Text] [Moscow IZVESTIYA in Russian 10 Mar 84 p 1] 8750

'AES' CONSTRUCTION-SITE HOUSING--Anadyr--The settlement for builders and operating workers of the nuclear station--the first in the country's Northeast--is rising up. About 700 families have celebrated housewarmings since the last elections to the USSR Supreme Soviet. Right now rebuilding of the AES has started. It is being expanded, and that means the settlements will become even larger. According to the master plan for its development, tens of new multiple-apartment housing units with all the conveniences, sanatoria and prevention clinics, a Pioneers' Palace with a school for the arts, and preschool children's institutions will rise up in the river valley, amid taiga woods. [Extract] [Moscow SEL'SKAYA ZHIZN' in Russian 26 Feb 84 p 1] 11409

FOURTH CHERNOBYL'SKAYA 'AES' UNIT--The CPSU Central Committee and the USSR Council of Ministers have congratulated the builders, installers, operations workers, designers, machinebuilders and all participants in erection of the fourth power unit of the Chernobyl'skaya Nuclear Electric-Power Station imeni V. I. Lenin. The Chernobyl'skaya AES is today one of the Soviet Union's largest nuclear power stations. Since the moment that its first power unit started up, it has generated more than 82 billion kWh of electricity. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 12, Mar 84 p 3] 11409

THIRD KURSKAYA 'AES' UNIT--Kurchatov, Kursk Oblast--The capacity of the Kursk Nuclear Electric-Power Station has risen by still another million kilowatts. Yesterday the station's third power unit was accepted for permanent operation by the state commission. The AES at Kurchatov, which has already generated more than 70 billion kWh of electricity, has played an important role in the forming of the regional production complex that is based upon the mineral resources of the Kursk Magnetic Anomaly. Construction of the AES continues--the footing for the fourth power unit has been laid down. [Text] [Moscow TRUD in Russian 21 Dec 83 p 1] 11409

ROSTOVSKAYA 'AES' CONSTRUCTION--Volgodonsk--A brigade is being formed [at the Rostovskaya AES construction project] to turn over, under an amalgamated contract, before the end of the year, 2 kilometers of finished levee. Last year at least that much rock was dumped, but only 200 meters of concreting were managed. This is how the contract has multiplied our strength. It turns out that the earnings of foreman V. Kochibekova and superintendent M. Yelizavetskiy now depend directly upon the results of the brigade's work. The plan for the first two months of the year was exceeded. The work is proceeding

smoothly, without interruption. And this means that one can be assured about the fate of the contract and the commitments. [Text] [Yu. Aleynikov, chief of Special Section No 4 of Atomenergostroy [Administration for the Construction of Nuclear Electric-Power Stations]] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 20 Mar 84 p 1] 11409

HIGH-SPEED TURBINE DEVELOPMENT--"The machine corresponds to the highest quality category"--that was the decision adopted by the state commission, which completed its work at the Elektrosila Association yesterday. The high appraisal was awarded for the developments of the designers of the organization's scientific-research institute, in accordance with which the country's first "high-speed" turbogenerator, of 1 million kW capacity, was manufactured for nuclear power. The computed parameters were completely confirmed during the tests of the lead model of the "million-kilowatter." Unlike serially produced turbogenerators of this class, the new machine works with doubled rotor rotating speed--3,000 rpm's. This circumstance influenced the reduction in materials intensiveness. In comparison with "slow-running" models, the new design saves up to 20 percent of the materials for each "million-kilowatter." [Text] [Leningrad LENINGRADSKAYA PRAVDA in Russian 16 Mar 84 p 1] 11409

STRUCTURE FOR NUCLEAR PLANTS--"Ahead of schedule"--the first large metal constructional structure from the Leningrad Hydromechanical Equipment Plant was sent to the Balakovo Nuclear Electric-Power Station with this remark. The items, which weigh more than 80 tons, are needed for installing above the reactor a crane that will be used during AES operation. The enterprise's workers should send about 200 more tons of such structure to the station, which is being built in Saratov Oblast, within the next few months. During work on the Balakovo order, the brigades of M. M. Polyakov, welders N. N. Khanayev and V. M. Tikhomirov showed high labor productivity. New equipment that had been introduced into operation at the enterprise helped here: machines for plasma cutting of metal, a scissors press for cutting out patterns from steel plate up to 30 mm in thickness, and semiautomatic welding equipment. The production workers brought this equipment up to its designed operating modes within a short time. The reequipping of departments and sections with machinery, which is being performed at the plant, has become the main reserve for raising labor productivity. Work results for January showed that it had risen at the pace called for by the collective's socialist commitments. [Text] [Leningrad TASS] [Leningrad LENINGRADSKAYA PRAVDA in Russian 12 Feb 84 p 2] 11409

CSO: 1822/226

DESIGN DETAILS OF SAYANO-SHUSHENSKAYA GES DESCRIBED

Moscow TEKHNIЧЕСКАЯ ЭСТЕТИКА in Russian No 2, Feb 84 pp 5-7

[Article by A. V. Sedykh and A. V. Poshivalov, artist-designers of the LF [Leningrad Branch] of VNIITE [All-Union Scientific-Research Institute for Engineering Esthetics]: "Development of Equipment and Interiors for the Sayano-Shushenskaya GES"]

[Text] During the Ninth Five-Year Plan the Sayany Regional Production Complex--the Sayano-Shushenskaya GES and a number of large power-intensive production facilities, as well as light-industry and food-industry enterprises--started to take shape in the south of Krasnoyarskiy Kray. The complex's power base is the Sayano-Shushenskaya Hydroelectric-Power Station on the Yenisey, with a capacity of 6,400 MW and a dam height of 200 meters.

The collectives of many enterprises from various cities of our country were involved in the hydropower station's integrated design. A large amount of scientific research, experimental work and design development had to be executed, and structures and equipment that were reliable, economical and convenient for operation had to be created.

The Leningraders' share was 95 percent of all the design and scientific-research and 70 percent of the production work on the principal hydraulic and electrical-engineering equipment. The complexity of this task led to the birth of a new form of socialist competition and creative collaboration; the 28 Leningrad enterprises and organizations and builders of the Sayano-Shushenskaya GES, at the initiative of the Leningrad Section of Gidroproyekt [All-Union Survey, Design and Scientific-Research Institute imeni S. Ya. Zhuk], adopted joint socialist commitments--"the Agreement of the Twenty-Eight." The reserves of each collective that participated in building the station were mobilized, and, the main thing, interagency concerns were coordinated. The initiative of Leningrad's hydraulic construction workers was approved by the CPSU Central Committee and was recommended for wide dissemination to the country's other new construction projects.

The Leningrad Branch of VNIITE became one of the main participants in the "Agreement of the Twenty-Eight." It undertook the commitment to perform in the shortest possible time the integrated artistic-design development of the machinery, instruments, interiors and service and operating premises and also to coordinate the work of the artist-designers of subunits of other participating members of the Agreement.



Unlike the experience of past years, when the designers made drawings only of separate elements and components for various GES's [the Aswan, Jerdap-Iron Gates and Balimela], the GES equipment for the Sayano-Shushenskaya GES was developed in comprehensive fashion. It was arbitrarily broken down into two topics: the "Dam" (the loading-lifting equipment for the gates), and the "Power Station" (the equipment for the machine room, the central control panel, the interior of the administrative and workers' premises of the operational services building, and also the architecture of small shapes). In order to do the work, the branch formed a creative brigade of artist-designers, engineers, architects and ergonomists.

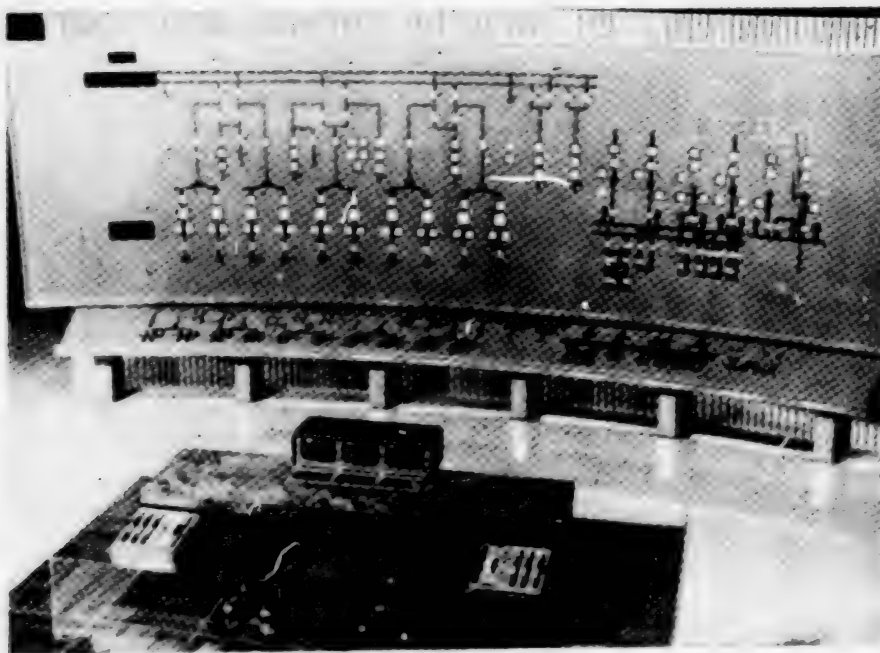
The first job was the artistic-design development of the semigantry crane for the hydropower station's machine room, which was performed by designers N. L. Akopova and V. I. Zakolupin and others, jointly with Zhdanovtyazhmash [Zhdanov Heavy Machinebuilding Association] specialists (of the city of Zhdanov). In designing the crane, both the production-equipment and the ergonomic requirements were considered, a unity of the crane's volumetric, three-dimensional and color characteristics and the machine room's interior was found, and the operator's working conditions were optimized. Special attention was paid to the crane operator's cab. Its location in the overall structure of the machine was found, its interior was worked out to take the specifics of operation into account, and rest areas were specified for the crane operator. A new crane operator's chair with a converting back and seat was proposed that enabled the chair to be adapted easily to the operator's individual anthropometric data and comfortable working conditions to be created.

Designers R. N. Ishanin and A. V. Poshivalov, jointly with Ienpidrostat' SKB [Special Design Bureau] specialists and others, developed a design for a gantry crane for the hydropower station's tailrace. Optimal placement of the control post's cab, which was attached to the floor of the portal's lower compartment, was something new in the crane's solution. With such a layout and configuration of the cab, the operator can freely observe both the instruments inside the cab and the whole space below the crane. The cab and the compartment are entered by a ladder that is situated on one of the portal supports that faces the GES building's side.

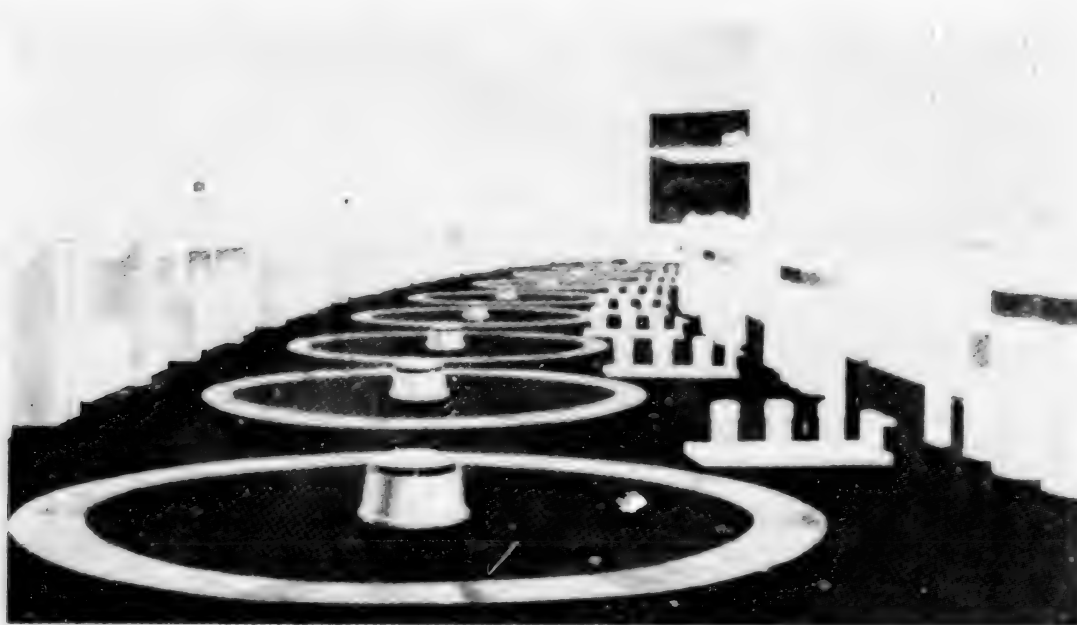
Still another substantial development of the dam's load-lifting equipment is the design of the gantry crane for the dam's headrace (artist-designers A. V. Sedykh, S. V. Aleksandrov, B. A. Gerasimov, jointly with Zhdanovtyazhmash specialists). Back at the design-sketch stage of this crane, in 1980, the work was awarded an honorary certificate of the Coordination Council for Construction of the GES.

In considering the specifics of the design of the load-lifting machinery, after studying and analyzing domestic and foreign experience in this field, and relying upon many years of in-house experience, the designers managed to resolve the basic form-shaping volumes of the crane fairly simply and, at the same time, expressively, coordinating the shapes with the architectural sculpture of the whole dam.

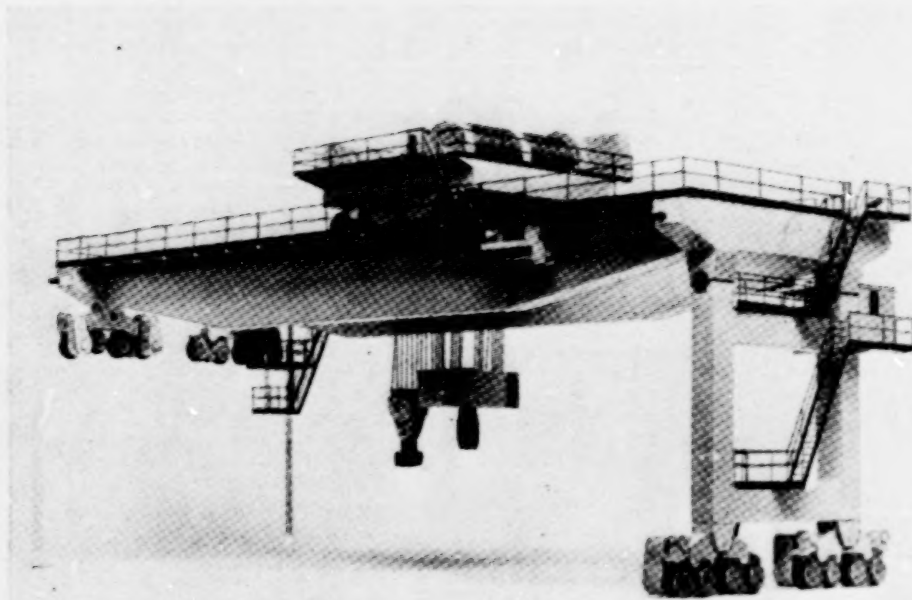
For the other topic, the electric-power station, the artistic designs of the machine room and the station's Central Control Post were drawn up in



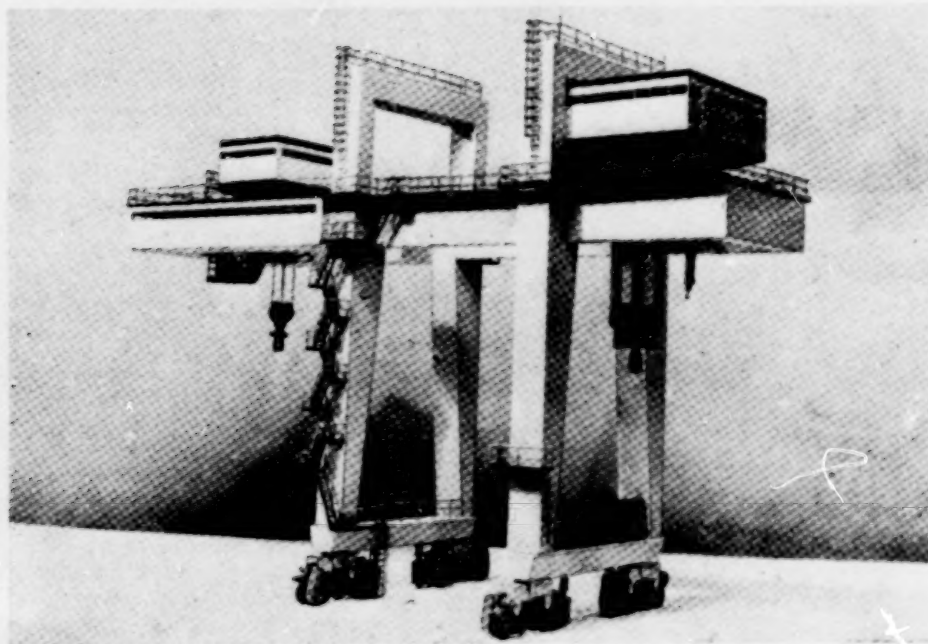
1. The Hydropower Station's Central Control Post (a Model).



2. Interior of the Machine Room (a Design).



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3. Semigantry Crane for the Sayano-Shushenskaya GES's Machine Room  
(a Model) [upper photo].

4. A Gantry Crane for the Headrace (a Model) [lower photo].

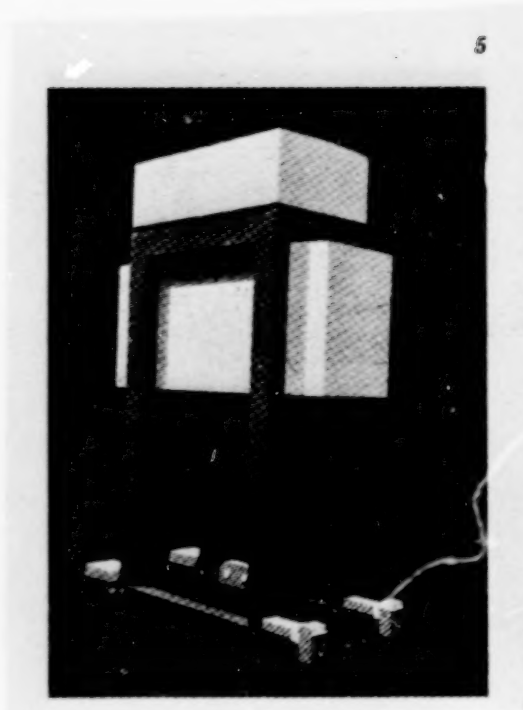
collaboration with Gidroproyekt's architects. Optimal placement of the machine-room equipment and a color solution for the interior were found, and facilities for visual communication and visual agitation were designed. A separate object of design was the post of the machine room's on-duty engineer. A maximum of glassed area of the post and its convenient location relative to the room's other equipment greatly increased the room's functional characteristics.

The Central Control Post's design (the artist-designer was M. A. Kos'kov) included solution of the interior and of the electronic equipment (the display board, the control panel and the on-duty engineer's desk). The general requirements for the lighting environment of the TsPU [Central Control Post] was formulated on the basis of scientific research that had been conducted, and recommendations on the specific solution for it were made (the engineer was V. A. Braylovskiy).

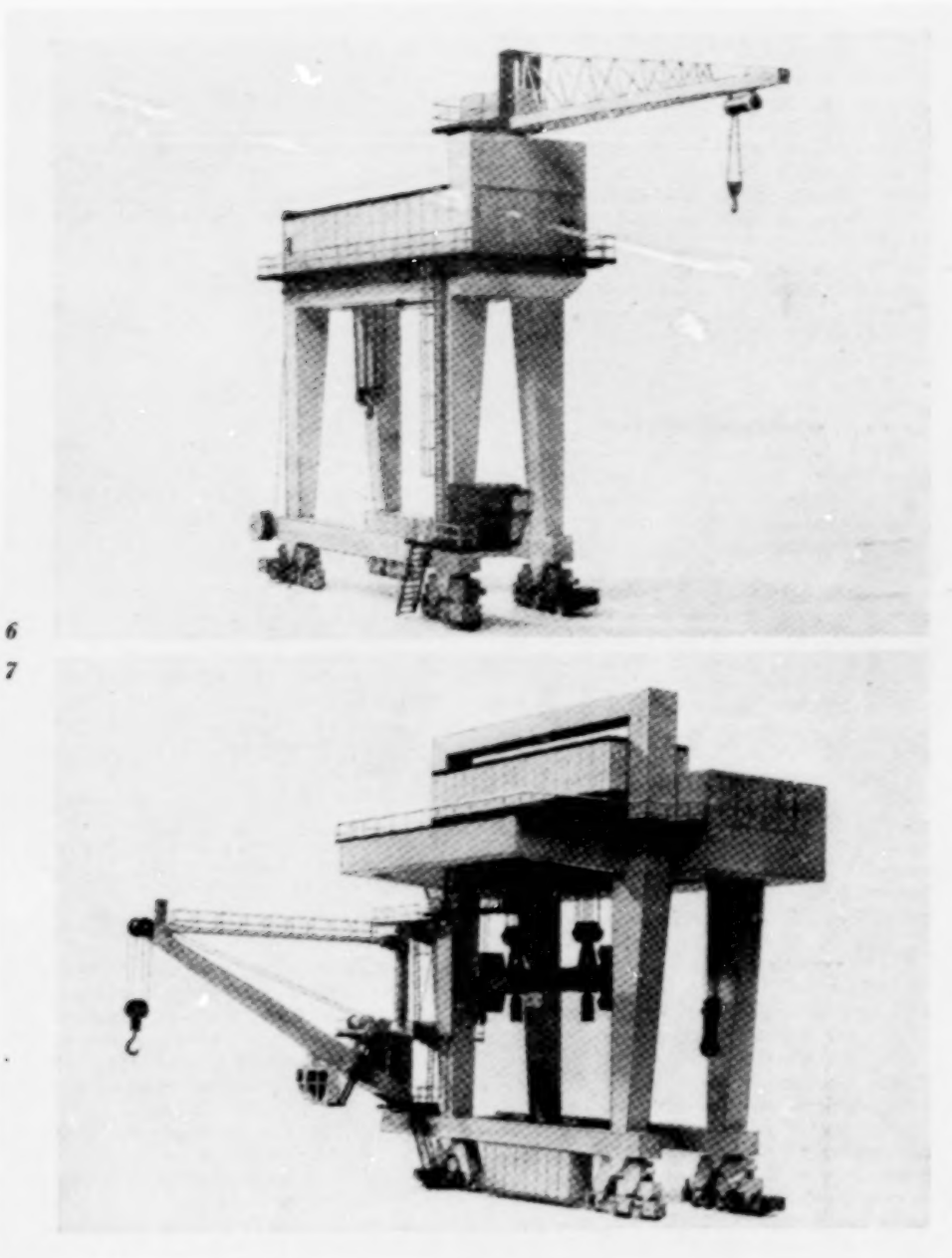
For the first time in practice, the branch also drew an integrated design for the operating equipment. This was on the work order of Leningrad's Elektrosila Association--one of the main producers of equipment for the Sayano-Shushenskaya GES. The equipment, which was different in dimensions, volume and purpose, was developed as a unified set, marked by stylistic commonality. Such interiors as the operational services building (the offices of the director and the chief engineer, the reception room, the meeting hall, the entranceway, a dining room and many premises for the everyday amenities) were included in the developments, together with suggestions on the finish of the furniture and the equipment.

The Leningrad Branch is now performing designers' surveillance over introduction of the artistic-design developments at the manufacturing enterprises. All questions are being solved responsively and successfully, jointly with Gidroproyekt's specialists, at working meetings of the Coordination Council. Reports about progress in meeting all goals are transmitted quarterly to the Coordinating Council.

In accordance with the decision of the Coordinating Council, the branch's designers also carried out artistic-design developments for the Maynskaya GES, which is within the Sayany Regional Production Complex. These were two gantry cranes which were intended for operation while the station was being built, and also during its operation, and an electric overhead traveling crane for the machine room.



5. The Gantry Crane for the Dam's Tailrace (a Model).



6 and 7. Two Special Gantry Cranes for the Mainskaya GES (a Model).

The artistic-designer developments of equipment for the Sayano-Shushenskaya GES can serve as an example of the integrated solution of questions when there is a creative incentive for collaboration of all the organizations involved.

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